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THE Railway Surgical JOURNAL

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THE CARE OF THE INJURED PATIENT.

CIMARRON RIVER WRECK.—SOME POINTS OF INTEREST.*

J. A. OVERSTREET, M. D., KINGFISHER, OKLA.

The wreck occurred at 8:45 a. m., September 18th, at the bridge on the Cimarron River, six miles north of Kingfisher. No. 12, the wrecked train, was about three and one-half hours late. It was raining and the morning was cold.

The bridge in question is 1,006 feet long. It gave way as the train ran on it from the south, the piling having been loosened by the extreme and very sudden rise of the river.

The engine and four cars, consisting of one combination baggage and express, one mail car, one smoker and one day coach, were precipitated into the river in water and mud about 22 feet deep. The current floated the day coach to a point near the south bank and turned it on the side. The top side of this car was reached almost immediately by the train conductor, who kicked in the glass and rescued passengers through the windows, a large number of whom were women and children. The smoker was carried several hundred feet down stream and lodged about 300 feet from the south bank. The passengers from this car in some way got out on top of it, where they could be seen for a few minutes, and were then knocked off into the river by the drift of another portion of the bridge which gave way later. Many of these passengers drifted to various point down stream, even as far as fourteen miles. The current of the river was so swift that no assistance could be given victims by parties along the bank.

I arrived at scene of wreck on an engine in about forty-five minutes from time of accident, taking with me three assistants. At this time all the injured and water soaked passengers who had been rescued had been placed on the two Pullman cars which had remained on the track. I immediately went through the cars and asked for those who were injured. I found five quite severely and many others slightly injured. Temporary aid was given to those most seriously injured first and other injuries attended as soon as possible. The five most serious injuries were, dislocated shoulder, injury to back, lacerated hand and two internal injuries.

All injuries were dressed temporarily and patients made as comfortable as possible and the cars taken to Kingfisher, a distance of six miles, where all were cared for till they could be sent home or to hospitals, as seemed best in each individual case. While first aid was being given an assistant was directed to take statements of all persons who alleged injuries.

A summary of accidents so far as can be ascertained: About 115 people were on the train at the time the wreck occurred; about 65 were carried into the river; 3 deaths known to have occurred, 2 adults from drowning, the other, a child, from injuries, about eighteen hours after

*Read at the fourth annual meeting Rock Island System Surgical Association, Hot Springs, Ark., December 5, 6, 1906.

the accident; 1 person is still unaccounted for, probably in the river; 21 others injured, all convalescent.

The first point impressed on me as a local surgeon was the importance of getting to a wreck at the earliest possible moment, with a good supply of first aid or emergency dressings. By so doing and announcing to the injured that you are sent by the company to give them the best possible care, confidence is inspired, excitement and suspense lessened, and you are enabled to grasp and control the situation and to keep the injured from the hands of people and physicians unfriendly to the company.

In order to go promptly to a wreck your emergency cases must be packed, so that all you have to do when called is to pick them up and start. In this respect I was prepared, having profited by the experience of Dr. Moershel and his excellent paper read at our St. Joseph meeting. I find it important in the selection of dressings and necessary articles for an emergency case, that great care be taken to avoid getting cases too heavy to carry. I use a telescope 15x24x8 inches and an ordinary leather cabin bag 8x8x16 inches, in which I carry:

25 yards plain and bichlorid gauze.

4 pounds absorbent cotton, in assorted sized packages.

2 pounds gauze bandages, assorted sizes.

20 yards 3-inch adhesive plaster.

1 dozen plaster-of-paris bandages.

½ dozen flannel bandages.

1 dozen U. S. first aid packages.

4 cards binder's board, for splints.

½ lb. boric acid.

¼ lb. bichlorid tablets.

2 oz. tr. iodin.

4 oz. antiseptic soap.

½ lb. vaseline (borated).

1 dozen aseptic paper drinking cups and all necessary emergency instruments. (In order to lessen weight, I order all gauze and dressings in cartons instead of glass jars.)

At scene of wreck I made no attempt to apply permanent dressings. I either douched wound with an antiseptic solution and then applied sterile temporary dressings or simply applied U. S. first aid dressings, till the injured could be taken to a convenient place where wounds could be thoroughly cleansed and properly cared for. The U. S. first-aid dressing was presented to the Association last year by Dr. Clark at El Reno. The package contains

One piece antiseptic lintine.

One ribbon bandage with safety pins, and

One triangular bandage.

The package is really intended for the laity, but will be found very convenient in the emergency case. I experienced some difficulty in finding the U. S. package. The one I present is made by Johnson & Johnson at a cost of 12½ cents each.

Another point of seeming importance is that every person who was on the train at the time of wreck *should be asked directly if he or she has been injured.* About three hours after the wreck, when a train had been made up to take the regular run of No. 13 south from Kingfisher, a lady, who had been in the Pullman at the time of the wreck and had remained in the car, as I supposed, continuously, at no time having complained of being injured, sent for me and stated that she had expected to continue her journey, but that she was feeling so bad and was suffering from so much pain from effects of her injuries that she would have to be taken off the train. She then stated that when the wreck occurred she had been thrown violently to the seat in front and then jerked back, wrenching her spine. She at the same time complained of intense pain in the left inguinal region. She also stated that she was just recovering from an inflammation of the left ovary and was on her way to Colorado Springs for her health. She was carried from the train, taken to a hotel and carried to her bed. She presented symptoms of hysteria and in addition complained of intense pain in back and left inguinal region on pressure and on movement. I could find no external evidences of injury. She remained in bed, with very little improvement, till the claim adjuster had made settlement with her. A few days after settlement, she was able to resume her journey. I learned afterwards that this woman had been out of the car and into the station and had done some telephoning before sending for me or alleging

injuries. I feel in this case that had I asked her personally soon after the wreck, if she was injured, before she had had time to think the matter over, she might have committed herself in the negative and would not afterwards have had the nerve to allege injury. This is why I think it important to ask every one, personally, who has been on a wrecked train, as soon after the accident as possible, if he is injured, and record his answer.

I also consider it very important to strip and examine an injured person from head to foot, as I found in some cases where this complete examination was not made at first, new injuries would be alleged later; and another advantage of a careful examination is that the patient will be more inclined to believe you and have more respect for your opinion and counsel afterwards.

RECTAL TRAUMATISM.*

A. F. BARFOOT, M. D., LOCAL SURGEON, DECORAH, IOWA.

The subject of rectal traumatism has—judging from the scarcity of literature on this subject—received but scant attention.

This is probably due to the protection it receives from anatomic location, the tuber-ischii preventing the frequent occurrence of injury direct to that viscus.

Children are injured more frequently than any other class on account of their climbing tendencies, especially when picket fences were in general use, but fortunately these are going out of use, so that cause is not so frequent as formerly.

The next cause in order of frequency is probably from the careless and hurried introduction of the end of a syringe, one case of which I recall very distinctly where a hospital nurse subjected a patient to quite an extensive and painful operation from injury caused by the introduction of a syringe. Rectal bougies used in dilating stricture sometimes penetrate the rectal wall where too much force is used, and it can be readily understood how rupture might be caused from rapid dilatation where there was ulceration of the rectum.

The indications for treatment are practically those used in other injuries such as control of hemorrhage when necessary by ligature or pressure, bringing the parts injured in as close and perfect apposition as possible, with the strictest of cleanliness followed by perfect quiet in the recumbent position, until all signs of inflammatory tendencies have disappeared.

I wish to report a case which interested me very much and which I hope will be of interest to others. On July 6, 1905, I was called fifteen miles in the country to attend an accident case. The party who telephoned was not willing to give any details on account of the publicity of country telephones, so I carried as full an emergency outfit as I could use without an assistant.

On arriving at the place of accident I found Ed— S., a young man about 17, had on starting to slide off a load of hay struck on the upper end of a pitchfork handle which had been previously slid down the same load. The fork handle after passing through his clothing had penetrated the rectum for a distance of 4 or 5 inches. He had alighted so squarely on the fork that he had balanced momentarily on its top before falling to the ground. There was only a slight bruising externally on the left side of the anus, but not sufficient to penetrate the skin or, as further examination showed, to lacerate or tear the muscular fibers of the external sphincter.

The young man showed decided symptoms of shock, and in fact was in a state of almost complete collapse, as much from fright and dread of what he might have to undergo as from the injury. He was not in pain and complained only of a heavy burning feeling in the rectal region.

After hypodermic stimulation, his parents not wishing him to take an anesthetic unless absolutely necessary, I made a digital examination of the rectum and found at about the junction of the middle with the upper portion the fork handle had penetrated the posterior rectal wall

*Read at the fourth annual meeting Rock Island System Association, Hot Springs, Ark., December 5, 6, 1906.

a little to the right of the median line, its progress being stopped by the curve of the sacrum. The puncture was slit-like in character and, as near as could be ascertained, from 1½ to 2 inches long, and on account of the slit-like character the opening closed itself fairly well and gave to the finger the sensation of a clean-cut rather than that of a punctured wound.

This condition was also verified by examination with speculum.

The almost perfect closure of the slit-like puncture probably accounts somewhat for the good results that followed. There was no hemorrhage at the time of the accident or during the examination. A thorough rectal flushing with a warm boric solution relieved the feeling of weight and burning, but the condition of collapse continued, though not so marked as at first.

The bruised and lacerated condition of the puncture was such that a removal of a portion of the rectal wall would probably have been necessary and the place and surroundings such that its attempt there would have been worse than useless. I left instructions for the night, expecting to arrange the next morning for his removal to the nearest hospital at La Crosse, Wis.

The patient rested fairly well most of the night, but became restless toward morning, while his temperature rose to 103 2-5, which proved reactionary, as he was then coming out of shock. His parents positively refused to allow his removal that day, as they had concluded he could not live, and wanted him to die at home rather than in a hospital. A boric flushing was continued at intervals during the day with a marked improvement in his condition, so by the second morning his temperature was almost normal and continued so until his complete recovery. His condition was so satisfactory that I did not feel justified in subjecting him to the risks of an operation, so continued the boric flushing, keeping close watch of his temperature and general condition.

A suppurative discharge continued for about four weeks, when it ceased, and he was allowed to sit up, and later began moving about. Six weeks and again three months after the accident thorough rectal examinations were made, but nothing more than cicatricial tissue could be seen or felt.

The most prominent feature of the case during the convalescing period was the peculiar psychic condition that developed after what under ordinary conditions the patient should have been practically well. For the first few weeks after the accident the young man did not exhibit anything unusual in his mentality more than his desire to have everything quiet.

After he was able to move about quite freely, and even to ride to town a distance of fifteen miles without becoming very tired, he began to worry about himself and to imagine that he never would be perfectly well again without having an operation, although he continually improved in strength and in weight.

This idea became so impressed on his mind in spite of all that I or his friends could say or do, that it was about decided to send him to a hospital to have something done to relieve his mind, as his mental condition was becoming more serious than the original injury. He was finally persuaded to wait for a short time longer and then to attend school away from home. The school work and school surroundings gradually took his mind off himself, so that at the end of his school term he returned to his regular work on the farm. This nervous condition, resulting from his close study of himself, at one time threatened a mental break-down, and had there been a corporation of any kind that had in any way contributed to his injury, it would probably have resulted in a damage suit, but as his own family were the only ones interested he had to use other means of breaking up this intense introspective condition.

For the past season he has worked at home and seemed exactly as he had prior to his injury without exhibiting any return of this unusual mental phenomenon.

It is always desirable, if possible, to leave as much as possible of a digit, as it is wonderful how useful even a small portion can become if it can approximate any other fingers which have escaped injury.—*Wheeler.*

IMPORTANCE OF EARLY DIAGNOSIS OF INJURIES.*

C. W. REYNOLDS, M. D., HOLTON, KAN.

In deciding to write a paper for this Association, the selection of a subject seemed quite a problem to me. In reviewing the subject of the papers of our previous meetings I notice that the treatment of the various injuries had in the most instances received quite thorough attention, so the "Importance of Early Diagnosis of Injuries" appealed to me as demanding as much attention as in any other field. This subject will require more attention from those like myself, living in small towns and having a limited experience in the care of injuries.

I think there are few, if any, of us but can recall cases of fatal termination where autopsy revealed distinctly the fact that a prompt and correct diagnosis with proper treatment would have saved life. Especially is this true of many injuries of the organs of the vital cavities of the body, if we will only exhaust the various means of diagnosis at our command, and without hesitation employ exploratory operation—which, with aseptic surgery, can be done safely to almost any joint or cavity of the body—besides saving many lives and getting better results, after treatment, we also save many damage suits for railroad companies and other corporations, as well as malpractice suits and chagrin for ourselves.

The last few years have so modernized the treatment of injuries that the responsibility of the surgeon has been very much increased, not only of the surgeon, but also of the general practitioner who does no operative work, as the greatest responsibility is in making an early and correct diagnosis. In my few remarks I will speak principally of the injuries to the organs of the cranial and abdominal cavities, as serious injuries to these organs are more commonly overlooked than those of the chest and other parts of the body.

Surgeons in hospital practice frequently have patients brought in a comatose condition, with little or no history, so they must make a diagnosis between brain injury, epilepsy, opium poisoning, alcoholism, or some such condition. Serious injury may occur to a man with epilepsy or alcoholic intoxication, but a short observance of persistence and character of symptoms will almost always clear up a diagnosis.

Fortunately, in railway injuries a quite satisfactory history can be gotten in most cases. In train wrecks, with serious injuries of several people and with confusion usually present, there is some excuse for delayed diagnosis, but at the earliest possible opportunity a thorough examination should be made and patients kept under close observation for at least twenty-four hours, to detect development of symptoms of brain pressure from depressed fracture or hemorrhage, or those of ruptured or damaged abdominal viscera. Many of these people with fatal injuries at first appear to be but slightly injured.

To illustrate the subject of my paper I want to mention a few cases occurring under my observation, three of them cranial injuries, and but one of them occurring in my own practice, not that they are unusual cases, but because they are very common forms of injury:

Case 1. A man of 25, in an altercation with a brother, was struck upon the left parietal eminence with what I call the heel of an ordinary shovel, being stunned, and apparently hurt. A physician was summoned, who, after having examined him, pronounced it brain concussion with scalp contusion, calling in once or twice in the next day or two, but not recognizing the real cause of the stupor which slowly came on, followed by coma, and at the end of forty-eight hours death ensued. I was present at the autopsy, which revealed the presence of a depressed fracture of the parietal bone, with a large blood clot. This case shows plainly a case where prompt diagnosis and proper treatment would have saved the patient's life.

Case 2. A man of 23, through some misunderstanding with a fellow, was struck upon the head over the junction of the frontal and parietal bones with a club, being knocked down and rendered insensible for a few minutes, got up seeming quite himself and but little hurt.

*Read at the fourth annual meeting Rock Island System Surgical Association, Hot Springs, Ark., December 5, 6, 1906.

After walking about the street for a short time he began feeling badly and got on his horse and started to ride to his home some distance in the country, but after going about one-half mile out of town dismounted, tied his horse and laid down on the ground. He was seen lying there by passing parties, who, thinking him drunk, did not molest him. During the night it rained and sleeted on him, and when found the next morning, still lying there in an unconscious condition, he was taken back to town and a physician summoned, who, noticing the widely dilated pupil on the same side of the injury, with other symptoms, at once saw he was seriously injured, though before he could secure the assistance of a surgeon the patient died. An autopsy was immediately made and showed the depressed fracture at the above location, with a blood clot almost the size of half a cocoanut. The result in this case, if it had been in skillful hands after the injury, leaves but little question.

Case 3. This case occurred in my own practice. A boy of 18 was struck on the head by a stone thrown by an enemy. He fell to the pavement, was immediately picked up and carried to a nearby drug store, where I saw him in a stupor and vomiting, with a depressed fracture of the squamous portion of right temporal bone. An extensive hemorrhage from the ear indicated that the fracture extended through the petrous portion of the bone. On account of the lack of intelligence in the family, immediate operation was refused, and patient was treated on the expectant plan, with a few small doses of morphin. He rested fairly well, and took nourishment in small quantities for the next two days, when he began to have marked pressure symptoms in the way of convulsions, slow respiration and circulation. Seeing that if left in this condition he would die, the family allowed me to operate, which I did by lamplight, removing a portion of the squamous part of the bone a little more than 2 inches in diameter, which was depressed fully ½ inch. There was no blood clot. Rapid recovery, with the loss of the hearing of the right ear, was the result.

This case shows the great danger in delay, as the patient was in a questionable condition for taking the anesthetic, and in a few hours at most would have died. It may seem strange to many of you that in these modern days anyone would be allowed to die of such injuries, where opportunity to save life was so good, but it is a frequent occurrence.

Passing on to injuries of the abdominal cavity, very much the same things may be said of them as of those of the cranium, except that diagnosis is more difficult and uncertain. All injuries of the abdomen and its organs should be considered serious until proven otherwise.

A history of violence to the abdomen with intense deep-seated pain, tenderness and characteristic facial expression, circulation and respiration, would make quite a plain picture of an injury of an intra-abdominal organ, demanding laparotomy, but so often they do not give us typical pictures, but require all the means known to science to make us feel justified in deciding as to it being a trivial injury demanding no attention, or a grave injury requiring a serious operation.

Our patients should immediately receive the best means of combating shock, but morphin absolutely prohibited until diagnosis is made and usually until the necessary treatment is decided upon, the shock of continual internal hemorrhage will not respond to heat and stimulants, but demand immediate action for its control, the same as for hemorrhage anywhere. Extreme pallor with continual collapse and dullness on percussion will assist very materially in the diagnosis of hemorrhage. The certainty of infection from rupture of the hollow viscera makes an early diagnosis imperative. To show what serious injury may come from a slight violence and the kindness of nature in an effort to repair, I wish to mention one more case.

Case 4. A young man about 24, with an ankylosed hip joint, result of tuberculosis and albuminuria for several months past, while walking across the door yard during the evening tripped and fell across a suit case which he was carrying. He immediately complained of severe pain in the left lumbar region, with which he suffered all night, a physician not being summoned until next morning, when some relief was given. Bloody urine was being passed. I saw him about forty hours after his injury, still suffering severe pain in the same region,

abdominal muscles quite rigid, still having blood in urine, pulse and temperature about 100. Rupture of intestine was immediately diagnosed, and operation was advised. By the time I had gotten consent to operate, returned home, some ten miles, for operative equipment, and back, I found patient with pulse 120, temperature 104, abdomen tympanitic and apparently the beginning of a fulminating peritonitis. Under the circumstances no operation was done. By the following morning temperature and pulse had come down to about 100 and abdominal symptoms much improved. Patient was kept quiet, with no cathartics and practically no food for the next three days, when kidneys ceased their action, with coma and death following.

At autopsy the descending colon was found to have been ruptured and repaired by adhering over an extremely enlarged left kidney, the latter being diseased and seriously injured by the fall, as well as right kidney being diseased, was the immediate cause of death from uremic poisoning. From microscopic appearance I believed these to be tuberculous kidneys. Here, except for the diseased kidneys, recovery would have taken place by the accidental repair by nature, which is certainly a rare occurrence in this kind of injury.

To summarize briefly a few points above mentioned: Be thorough and systematic, using every known means of diagnosis, and persist until you are satisfied you have a serious condition to deal with, or proved to be otherwise, and avoid a snap diagnosis.

In patients with *Bright's disease* it is well to follow the rule that when the condition for which operation is required is more menacing to life than the nephritis, operation should be undertaken; when this is not so, it is well to abstain. Conditions such as rapidly growing malignant disease, intestinal stenosis, appendicitis, and such like, will be operated on in spite of nephritis; while benign tumors, malformations and other conditions of this type will be left alone. Chloroform should never be given to a patient with Bright's disease.—*Schlesinger.*

WHAT CAN BE DONE IN A HOPELESS CASE?*

J. C. GRAHAM, M. D., LA PORTE CITY, IOWA.

You will pardon the brevity of this paper—so little can be done for a "hopeless case."

Lacking a subject for a title, a claim agent, present at an accident which occurred September 29, at La Porte City, Iowa, suggested my taking the case then before us, and in addition to one other recent case, I concluded to do so.

Case 1. As a freight train was nearing the station, a brakeman in attempting to alight before the train stopped, met his death. It was supposed that in descending from the top of the car that he missed the foothold and fell. The injuries were two scalp wounds, an indented skull, and the fingers of one hand crushed. The man was found unconscious and died twenty minutes after the accident. I saw him ten minutes previous to his death.

The case was hopeless. The usual throng, including employes, had collected around the injured man. Surgical and medical treatment were employed, but to no avail. Hot water was obtained, the blood removed from face and head, and the injuries, including the hand, covered with gauze. When death occurred the body was immediately covered with a sheet. This was done before a stretcher could be obtained.

It is remarkable how quickly a crowd disperses when no blood or wounds can be seen, a great relief to the attending surgeons. Without police aid, a crowd will not leave an injured person while conditions exist that excite average curiosity. The attention paid this dying man was evidently much appreciated by his associated employes, an important item compared with the feeling engendered had he not been so treated.

During the short time attention was given to this man, the statement was made by a stranger that the brakeman was descending from the top

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*Read at the fourth annual meeting Rock Island System Surgical Association, Hot Springs, Ark., December 5, 6, 1906.

of a car. This was contradicted by a reliable witness with whom I was acquainted, who stated he either fell or was thrown from a box car in which were a race horse and two men. The two men were found, but denied that the brakeman had been in their car. Suspicion of foul play was suggested, and led to a coroner's inquest. The evidence brought out the fact that the brakeman was an old acquaintance of one of the men, and had been visiting with him between stations, and in attempting to get out of the car at the station to attend to his duties met with the accident referred to. What this meant to the company, compared with the man sustaining an injury in the performance of his duty, I am not prepared to say.

Case 2. A passenger fell from a train while in motion and sustained injuries which resulted fatally in about thirty-six hours. The family physician was called and had the man removed to a residence near by. The railroad agent called me and, with my colleague, the injuries were attended to. The family physician remarked the man's general condition would improve as soon as the effects of liquor had passed off. In this opinion I concurred, and made some remarks to emphasize the fact that the man was intoxicated. His friends of course talked of damages, consulted an attorney who conferred with me. After making the attorney familiar with the man's condition and the proof obtainable, he advised against action.

The railroad company generously paid this man's funeral expenses, although in no way liable.

Most railway surgeons live in small towns where there is no hospital or ambulance service, consequently attention has to be given the injured man wherever found.

To dispel a crowd, dress the injuries as soon as possible (aseptically, of course), eliminate all unsightly aspects. The surgeon can well afford to devote this much time to a hopeless case as it will show the solicitude of the company even to the end, and the associated employes will have a kindlier feeling for their employer. Be on the lookout for any facts others may know, which can be utilized if necessary.

And last, but not least, let our conduct be such as to have an influence with our coleagues, resident attorneys, and citizens generally, in the event of unfair and unjust action.

THE USE OF LYSOL IN ACCIDENTAL SURGERY.*

M. W. BACON, M. D., ENGLEWOOD, ILL.

Lysol, a preparation first put upon the market by Lehn & Fink of New York, is described by their literature as the result of the saponification with alcohol of the fractional distillate of tar oil, between 100 and 200° C., and contains 50 per cent of cresol. It is a dark reddish brown, oily, transparent liquid, having an odor resembling creosote. It is readily soluble in water, alcohol, benzine, chloroform or glycerin. In antiseptic properties, it is said to have five times that of carbolic acid in the same percentage solution. Compared with bichlorid of mercury, it is claimed to be very much safer and fully as effective.

One of the chief advantages claimed is that it does not coagulate the capsule of the germ, but rather tends to soften and penetrate the capsule, while both carbolic acid and bichlorid of mercury act by coagulating the germ capsule. Another advantage claimed is owing to its soapy character, loosens and removes germs from the wound surface.

Admitting the various advantages claimed for Lysol and the many uses to which it can be applied in solutions of varying strength, there would seem to come to the mind of the practitioner at least two objections. First, one perhaps purely ethical, that in using such a remedy, encouragement is given to the sale of a purely proprietary medicine. This objection, however, I imagine would not stand in the majority of cases, as results are what we are all after, and if we can get better results by the use of Lysol solution in the treatment of wounds than by any other, I think the most of us would use it. The second objection is the cost of the product. When used in considerable quantities, at the price asked by the producer, it becomes expensive.

*Read at the fourth annual meeting Rock Island System Surgical Association, Hot Springs, Ark., December 5, 6, 1906.

The new U. S. Pharmacopeia gives a formula for the making of liquor cresolis composition. This preparation contains 50 per cent cresol, and a soapy mixture is made by the addition of linseed oil, potassium hydroxid, and water. It has the same characteristics as Lysol, makes a similar looking solution, and contains the same amount of cresol. I submit a sample of each for your inspection. I have had my druggist prepare a quantity and am now using it where heretofore I have used Lysol. The latter costs 67 cents a pound—the liquor cresolis compositus, 25 cents.

Several years ago I began using Lysol solution in my office for instruments and hand solutions, also in obstetric work, and have used it exclusively with the best of results since my first trials.

More recently I have been making careful trials of its use in railway and street car accidents, where we have crushing injuries of the extremities and lacerations with loss of large amount of tissue. These injuries are all dirty—there is no exception, and in cases where you are compelled to do the first dressing in a drug store, police station, or ambulance, a careful cleansing of the wounds with a hot or 2 per cent Lysol solution, dressed with plenty of sterile gauze wrung out of a 1 per cent solution of the same, will give you almost invariably a clean aseptic wound for the second dressing.

At St. Margaret's Hospital, Hammond, Ind., a large percentage of the cases brought in are of accidental injuries, and we have for the past three years used the Lysol solution to the exclusion of all others. Asepsis, or aseptic technic, in the management of these cases, is far from perfect, but all wounds are cleansed as thoroughly as possible with the hot Lysol solution and a gauze dressing of the same applied. The results, as compared with other hospitals, are very favorable and speaks well for the method, for the accidents come from a great variety of sources.

One point I wish to particularly call attention to, and that is the favorable effect a ½ of 1 per cent solution of Lysol has upon surfaces which are left to heal by granulation, and I report two cases:

Case 1. J. A. B., a switchman, was injured about the 23d of May, 1906. He was riding home on a street car, and as the car passed his street corner he jumped off, without having the car stopped. He fell and his left foot was caught under the car-wheel. An extensive crushing of the heel and sole of the foot was the result. This man had a well developed case of tetanus, from which he recovered. On the 12th day of June, the case came under my care. At that time there was a raw surface, including the whole heel and sole and sides of the foot extending up ½ inch each side and forward to near the ball of the foot; also 1 inch of the fractured os calcis sticking out of the wound. The bone was removed and I began a dressing of a ½ to 1 per cent Lysol solution and have never varied it to the present time. At this date there is good sound skin formed over all surface, with the exception of a small place on bottom of heel 1½ inches in length by ¾ in width, and that closing over very rapidly. At no time in the treatment has there been anything but a smooth, healthy, granulating surface.

Case 2. Mr. C. On June 5, 1906, this patient was playing with a large and powerful bull-dog on a vacant lot near his home, and while there he attempted to prevent the dog from attacking a small pet dog which was crossing the lot. As he caught the dog in the rear, he turned and grabbed him by the side and top of the head, and by a perfectly clean tear took out a circular piece of scalp 4¾ by 3½ inches. The head was carefully shaved and the whole surface cleansed with a 1 per cent Lysol solution and dressed with gauze wrung out from the same strength.

The wound was entirely healed by the first part of September with good sound skin, minus hair. No other dressing was used and the wound always healthy and clean with no suppuration.

From an experience covering a great variety of injuries, it would seem that in Lysol, or its equivalent — liquor cresolis compositus — we have a valuable antiseptic for dressings in the numerous accidents which the railway surgeon

is called to attend, and particularly applicable in those cases in which the asepsis must be faulty.

EARLY AID TO THE INJURED.

J. P. STEWART, M. D., CLAY CENTER, KAS.

It might well be said at this time, while we are considering first aid to the injured patient, that we take a mental view of ourselves. In accidents and hurry calls to wrecks, when everything is in turmoil, and every one is excited, to be sure that we are in a proper frame of mind to do what is right and be able to work to the best advantage for those who need our assistance.

You will bear with me if I state some facts and experiences of my own. About eight years ago, a rear end collision occurred near Clay Center, about 4 a. m. It was a very dark, foggy morning, with five or six inches of snow on the ground, the day before it had thawed some in the road, sufficient to work them into mud, and then at night froze, so when I started from the livery barn in my buggy all you could see was a black streak between the white snow. It was a mile to the wreck. I started from the barn with two dash lanterns on my buggy. I did not go fifty yards over the rough and terribly frozen streets until they flew off and were smashed to pieces.

On my arrival chaos reigned, men were swearing, some were lifting and tugging at first one piece of wreck, then another, some groaning and weeping. A few people living near had arrived, there were probably a half dozen lanterns there. I secured one, and by some emphatic talk, found out who was supposed to be in the wreck, and where. Then I organized the men, had one of the train men take the lead. I insisted they should work as he directed. We had no hospital in our city then, but when I left home I aroused my family and ordered a boiler of water put on the stove.

We soon got out a brakeman. He was terribly crushed; had him taken to my house, where he died that day in my library. I had a conductor and another brakeman, who were only slightly hurt and suffering from shock, in other rooms upstairs. Then there was another man who lived in town; he was taken to his home. He had a fractured right leg, fracture of skull, and fracture of inferior maxilla. I sent for Dr. Munn, who raised the depressed fracture of the skull and wired the fractures of the jaw, but he died twenty-four hours later.

There was one man who was quite severely injured who got away from me, and he was the only one who caused litigation. This fellow wandered off down a street and got into a house; they called two other physicians; the result was he sued for $10,000, had two or three trials, and eventually collected $7,500, his attorneys getting one-half of that. In the meantime the fellow, who was a stockman and was financially embarrassed, "went broke," as we say out west, when, if he had accepted the settlement offered him by Mr. Graham, he would have saved his credit. So we must be careful in our call to the injured, so that faults of omission are not greater than those of commission. We must be tactful and firm, yet kind, gentle and active.

In August, this year, I was called to meet train No. 27, which arrived at Clay Center at 5 p. m., to see two ladies in different sleepers. Train was switching at McFarland and it was bumped pretty hard, one lady was in the toilet. She came out making great complaint, said she was struck or thrown against the car, striking the back of her head. She was hysterical when I saw her, making all kinds of threats against the road. I examined her carefully, found no lump or bruise. There was a doctor on the train who had given her bromid of potassium. In a few firm words I informed her and her husband she was not seriously hurt. The other lady had fallen in the aisle, face downward; she was severely shaken up, but she said it was nothing, that she would soon be all right. Neither she nor her husband seemed to think they had struck a mine in the Rock Island. I told the conductor to call Dr. Nelson at Phillipsburg if they were not doing well, and to have the conductor who went into Denver call the company surgeon to meet them on their arrival, as I was afraid of the first lady and did not want to take any chances.

In our first aid to the injured, we have shock to deal with more or less, and as has been said today, each has a different method for its treatment. In fact, we all agree, if we consider that every case of shock is a law unto itself. We may have shock from fright that a dose of stimulants with some external heat to extremities will soon overcome; then we have shock from the crushing of a part, without hemorrhage, that a hypodermic of strychnia and small doses of morphin with atropin and external heat will correct. Again, we will have shock from burns in proportion to their degree, in which warmth will be needed. As rapid dressing of the part as possible, strychnia, small doses of sedatives, possibly a rectal injection of hot saline solution. Lastly, we have the shock from loss of blood; stop the hemorrhage as soon as possible, give hot saline injections per rectum, by hypodermoclysis, or both. External heat, lower the head, and then be careful about stimulants, or you may whip a tired heart to its everlasting rest.

The first treatment of wounds and injuries is to arrest hemorrhage and combat shock, if present. Clean the wound and apply an occlusive dressing. And, as has been said, it is very necessary that we should make as careful examination of our patients as possible before moving them. If there is a fracture, it should be firmly adjusted or we might turn a simple into a compound one.

We have more lacerated and contused wounds than others. First, clean your own hands, then clean the wound. Lysol is a good saponaceous antiseptic to clean wounds with. I have used it with good results; also synol soap. But if dirt and grease are ground into the wound, I find turpentine one of the best aids in removing it. My favorite dressing is balsam of Peru and sterile gauze. I used it up to fifteen or twenty years ago, then quit it for other new things, like iodoform and aristol. But for the last year I have gone back to the balsam of Peru and I am more than satisfied with it. I believe it attracts phagocytic cells which envelop microorganisms, and by that process is a logical antiseptic and stimulant. If the wound is severely lacerated, after cleaning I swab it out with carbolic acid, full strength, follow with alcohol and dress with balsam of Peru.

For scalds and burns I have never used anything that gave me the satisfaction that the old fashioned carron oil has. I add 1 ounce of carbolic acid to the gallon, saturate clean gauze and use as dressing. Third degree burns may need more stimulating ointments as ichthyol with zinc oxid, and lanoline later on.

DISCUSSIONS OF PAPERS OF DRS. OVERSTREET, BARFOOT, REYNOLDS, GRAHAM, BACON, STEWART.

Dr. Frank Porterfield, Atlantic, Iowa: I wish to express just one thought in connection with the subject of early treatment of accidental injuries, suggested by two experiences in my own practice. These injuries occur rarely, but when they do occur, not infrequently the patients die without a diagnosis being made. I refer to rupture of the middle meningeal artery.

A case occurred in our community not long ago, in which a bystander watching a ball game was struck in the side of the head with a baseball. He stood around and watched the game until it was finished, after which he started home, and was found several hours afterwards unconscious in the weeds by the roadside. At necropsy the middle meningeal artery was found ruptured and a clot had formed.

The other case was that of a boy who was injured in a coasting accident, the sled running into a tree. He got up and went home, stated he did not feel well and did not want any supper, but did not seriously complain. He laid down while the rest had supper, became unconscious and never recovered consciousness.

If in those cases a diagnosis had been made immediately after injury, an operation might have saved life. It occurs to me that such an accident might happen in railway practice, and I think it is a good idea to remind ourselves that an injury of an apparently slight nature, followed several hours later by unconsciousness, is very likely to be that kind of an injury, and the patient ought to be the subject of immediate operation.

Dr. H. Neill, Sibley, Iowa: I am impressed with the importance of early diagnosis in these

cases, but I should think also that it would be important that an early prognosis be made.

About a week ago I was called in a case where a boy had been kicked by a horse over the right frontal eminence. There was a depressed fracture of the skull, the bones sunk in by the horse's hoof. He was quickly taken to a neighboring doctor's office, the wound was cleaned and the fracture raised, there being not the slightest trouble in elevating the bones; it was dressed cleanly, and then the doctor and myself thought it would be wise to give a very careful prognosis in the case. Whereas in our own minds we believed that the boy would surely get well—there was no injury to the dura, the boy recovered from shock and the anesthesia, was rational, and seemed in good condition—the outcome was far from favorable. The boy became delirious about 12 o'clock the same night and died in less than two hours. This simply brought to my mind the importance not only of early diagnosis, but of very careful prognosis in all such injuries.

A member: I would like to ask Dr. Reynolds a question: Did we understand him rightly when he said that the clot resulting from cerebral hemorrhage was as large as half a cocoanut?

Dr. Reynolds (closing): My paper states that the clot was almost as large as half a cocoanut. I will say that I did not see the case personally, but this was the report given me by neighboring physicians. I do not know how large a blood clot could form in the cranial cavity, but it seems to me, with the pressure of the meningeal arteries and the elasticity of the living brain tissue, a clot might form nearly as large as half a cocoanut.

Stomach paralysis is an accident which may follow anesthesia for operations of any kind. The signs are uncontrollable vomiting, at first of bilious matter and later of blood, and marked distension of the stomach. Sometimes the condition has a mechanical cause, such as kinking at the duodenojejunal junction, but in most cases it is a condition of primary paralysis and dilatation. In marked cases death is not unusual.—*Schlesinger.*

A SIMPLE METHOD OF TREATING A FRACTURE OF THE NECK OF THE FEMUR.*

H. A. BRENNECKE, M. D., AURORA, ILL.

In looking over the literature, I find my plan is more a modification of Dr. Leonard Freeman's idea than a method distinctly my own, as I had supposed. I find in an article (1) that he advocated placing a cushion behind the trochanter or using the plaster-of-paris cast for purposes of fixation.

A great many methods have been advocated for the treatment of this fracture, most of which are more or less objectionable and the results not all that are to be desired. My method, however, is so simple that I cannot refrain from briefly calling attention to the same.

The history of the case treated is briefly as follows: Male, age 45, sustained a fracture of the neck of the femur six months previous to my seeing him. On examination, I found the foot everted, the muscles of the limb atrophied, the patient unable to use the limb without the use of two crutches, and motion extremely painful. Measurements revealed two inches shortening in the femur. A skiagraph showed a fracture in the neck close to the head. I advised operation. The fracture was exposed by means of the anterior straight vertical incision, and the fibrous tissue was removed by means of chisel and scissors. The head of the femur was found very brittle or spongy so that plugging or wiring was out of the question. I, therefore, brought the ends into apposition; put in a small cigarette drain; sutured the wound and applied the usual dressings. Buck's extension was applied, using weight enough to keep the limbs of equal length. To prevent external rotation, I placed a 1-pound package of absorbent cotton behind the trochanter parallel with the limb, and held same in position by means of a surcingle strapped around the body at the level of

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*Read at the third annual meeting American Association of Railway Surgeons, Chicago, October 17, 18, 19, 1906.

(1) Annals of Surgery, 1904, p. 561.

the trochanter. This absolutely prevented eversion of the limbs; allowed easy access for inspection and dressing, and caused no discomfort to the patient. In applying the Buck's extension, I also departed from the usual method by placing the adhesive plaster on two thin perfectly flexible pieces of board about $\frac{1}{16}$-inch thick. These were fastened to the limb by means of two or three strips of plaster placed around the limb and applying an ordinary bandage. The patient was kept in bed about eight weeks.

After being up and about on crutches for two weeks, I found that the limb was not at all everted; he could bear his weight on it, and there was about $\frac{3}{4}$-inch shortening. A skiagraph showed the fracture in good position.

The chief advantages in the method are: (1) simplicity (2) comfort (3) the perfect position in which it keeps the limb.

FRACTURE OF CLAVICLE FROM MUSCULAR ACTION.—TREATMENT FOR FRACTURE OF CLAVICLE.*

A. C. MOON, M. D., WILLIAMSBURG, IOWA.

Fracture of the clavicle occurs in about 10 per cent of all fractures, and of all causes muscular action is most rare. I have had only one case in my practice, which occurred only recently.

Mrs. S., aged 60, sent for me in haste, but being in the country, another physician was called. He found the old lady suffering severe pain extending from back of neck over right clavicle and shoulder down the arm, tissues badly swollen over the bone, tender on pressure. Patient gave no history of an injury. He told them to apply hot fomentations and rest in bed, that I would see her next day. I called next day, found patient in bed, swelling reduced, still had severe pain in back of neck, over the clavicle and down the arm. I had her sit up, on examination found an oblique fracture at junction of the inner or greater curve with the outer or lesser curve. I told her she must have had a fall or that something had struck her. She denied having fallen or that anything had struck her, said she was cleaning the cupboard and was reaching up to move a heavy crock, when lifting it a pain struck her in the region of swelling and back of head extending down the arm. I told her she had a fracture of the clavicle, and that she must have fractured it when lifting the crock. I suggested she might have fainted and fallen, but the husband said he was in the next room and came to her when she screamed, that she was getting down from the chair and had not fallen. I concluded she had fractured the bone by muscular action.

Treatment: I dressed fracture with what I believe is the simplest and most comfortable dressing for most cases of this fracture, Moore's dressing, which I describe, as it is not mentioned in our latest books on surgery. It consists of a piece of cotton cloth, which when folded like a cravat should be about 2 yards long and 8 inches wide in the center. Placing this at the center across the palm of the surgeon, he seizes with this hand the elbow of the patient, which corresponds with the broken clavicle, the two ends of bandage hang to the floor, the one falling inward toward the patient is carried up in front of the shoulder and over the back, making a spiral movement in front of the shoulder. This is entrusted to an assistant. The outer end is then carried across the forearm behind the back over the opposite shoulder and around the axilla, this meets the other end, which may be carried under the axilla and over the shoulder of opposite side. This making the figure-of-8 turn around the sound shoulder. The twist, it will be seen, also makes the figure-of-8 turn around elbow of affected side. This fulfills all the requirements. That is backward, upward and outward position of the shoulder. You may place the hand in a sling for comfort.

The other dressings are Sayre's, Velpeau's, and in cases when the fragments cannot be brought into coaptation because of the presence of interposed muscular tissue, the ends may be sutured with kangaroo tendon, or silver wire. Sayre's method is good so far as holding the

*Read at the fourteenth annual meeting C., M. & St. P. Ry. Surgical Association, Chicago, December 13, 14, 1906.

shoulder and fractured bone in position, but in my opinion is the most painful dressing that could be applied. A patient having once been treated with the Sayre's method will look elsewhere if he should be so unfortunate as to have another fracture of the clavicle. Velpeau's dressing confines the chest so that patient complains of difficult breathing and unpleasant boxed-up feeling. The suturing is good and the only treatment to be applied in cases heretofore mentioned, but difficult for the general practitioner to attempt with the surrounding conditions.

The recumbent prone position fulfills all the indications and gives the best results when you can persuade the patient to try it. Some ladies will suffer the inconvenience of resting in bed for several weeks so that there will be the least possible callus formed, as it might interfere with their dressing decolleté. In cases of young children, carrying the arm in a sling will suffice. Green-stick fracture in children should not be treated the same as that kind of a fracture elsewhere, as it is unnecessary as well as impracticable.

DISLOCATION OF THE ACROMIAL END OF THE CLAVICLE.*

R. L. MURDY, M. D., ABERDEEN, S. D.

Dislocation of the acromial end of the clavicle comes in for its mathematical proportion of all dislocations, variously estimated at between 2 and 4 per cent; but it is so lightly mentioned and so mildly treated by our text-books, or not treated at all, as to lead the reader to believe that it was so infrequent or of such little consequence that it might be forgotten or expunged from medical and surgical literature as a nonentity or preserved as a surgical freak. On the contrary, it is a fairly common injury, and a formidable condition to meet. Those of us who have to deal with men who are employed in such occupations as subject them to blows and falls on the shoulder must be impressed with the frequency and magnitude of this injury; or else my personal experience is at variance with my co-workers. I tried to verify my personal experience from the literature, but as it is so meager on this subject, I was left to my own resources and to some of the later periodicals to get an adequate basis for this paper.

A brief reference to the anatomy of this part, and the multitude of functions that it has to perform, will assist us in comprehending the conditions that exist in dislocation, and suggest the mechanical and other factors involved in its proper treatment. The scapulo-clavicular joint is an arthodial one. The surfaces are held in position by the strong superior and inferior acromio-clavicular ligaments, which so encircle the joint as to practically convert it into a capsular ligament. It is further strengthened by the accessory coraco-clavicular ligament. It may or may not have an intervening fibro-cartilage. It is, therefore, capable of performing a multitude of motions and functions. The outer end of the clavicle is placed a trifle higher than the acromion.

The usual dislocation is the upward dislocation of the end of the clavicle and the reasons for this are largely as follows: the violence which usually produces the luxation is a severe blow to the acromion or a fall upon the point of the shoulder, thus driving the clavicle down against the first rib and acting further must dislodge the end of the clavicle and drive it through the superior acromio-clavicular ligament.

The extent of the laceration and the width of the displacement depends upon the violence and force of the injury and the vulnerability of the articulation. It is capable of being separated from a fraction of an inch to an inch and a half, without complete separation of the superior acromio-clavicular ligament. The upper dislocation is characterized by moderate pain and deformity (which is more or less permanent), a long period of disability and ultimate restoration to normal usefulness.

The symptoms of this dislocation are the step-like projections of the end of the clavicle, increased mobility of the joint, and in marked cases, deformity. The deformity is the same

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as in fractures of the clavicle, namely, downward, inward and forward misplacement of the shoulder. This injury should not be confounded with any other injury of this region, though it may simulate many of the injuries to the shoulder, such as fracture of the clavicle, and of the head and neck of the scapula, and the various dislocations of the shoulder. From fracture of the clavicle it can be differentiated by the equal length of the clavicles, the long projecting end of the clavicle, developed by traction downward on the shoulder, and the absence of crepitus. From the other injuries, a brief consideration of their classical symptoms will render differentiation complete.

The other dislocations of the acromial end of the clavicle are the downward or sub-acromial and the sub-coracoid. The downward dislocation is produced by some direct violence to the outer end of the bone, acting from above downward. This is a rather unusual form; of the authentic cases reported none have been hard to reduce, but some have experienced trouble in its proper maintenance. The prognosis is fair as to position and form, little or no deformity being manifest as a sequence. The prognosis as to ultimate recovery and usefulness is good. The sub-coracoid is so rare that I have not been able to find an authentic case on record that would indicate a primary position of this character. It is probably due to a secondary position of the sub-acromial dislocation. I have had no personal experience with the last two forms of dislocation above mentioned, so will not discuss them further than to call your attention to them and give you what little there is of record regarding them.

To impress you with the importance of making a careful and painstaking examination in every case of injury which might involve this joint, as well as another part of the body, I wish to give a short history of three cases.

No. 1. A young fireman was thrown from the gangway of the engine, while they were proceeding at a moderate rate of speed. He was picked up unconscious and remained in a more or less stuporose condition for twenty-four hours. Examination revealed a fracture of the foot, laceration and an extensive abrasion to the scalp. Very little external evidence of trauma to the shoulder was manifest. He came to me second-hand and some of these conditions I did not have an opportunity to observe, but as my attention was engrossed with this harmless injury to his head, and the fracture, I did not observe at first examination that he had sustained an injury to the acromio-clavicular joint that was going to produce a long period of disability; far beyond the injury to the foot and head. He complained very little of this injury, but every time I dressed him and examined him, it seemed to grow in magnitude. His disability continued, real or imaginary, for about six months. At this time, a little over a year, he says it is as strong as ever, and stands the work as well as it ever did, and he can shovel 10 to 14 tons of coal in ten hours.

No. 2. On the 30th of March, 1903, a fireman fell from the top of the tank on the tender to the ground, a distance of about 10 feet, struck on the right shoulder, and sustained a dislocation of the acromial end of the right clavicle, and some other injuries to the shoulder, possibly a fracture. The contusions and swelling made it difficult to determine the precise nature of all his injuries, but the dislocation stood out fairly prominent among his injuries and was the one thing that could be determined more clearly than any other. The usual treatment was instituted and the Stimson dressing applied. Progress was slow and never satisfactory. He was promoted to engineer at the end of six or eight weeks, while he was yet wearing this retentive apparatus. As engineer it was most difficult for him to work the levers during the entire summer, and he had to call often to have the adhesive supports applied. Any unusual push would give him pain and produce a sense of weakness in the entire arm and shoulder and increase the soreness in the articulation. Present conditions, three years and nine months after the accident, are a step-like deformity, clearly perceptible with the clothing removed and easily felt, easily fatigued, diminished pushing power and weakness in motions that require abduction.

No. 3. Last July I was thrown violently to the ground from an automobile, and struck on

the point of my shoulder, most of the violence came on the acromion, and the clavicle was only slightly displaced. The usual signs were present. My total disability was comparatively short, but I have suffered from partial disability up to date, and at this time I have defective pushing and lifting power in my good right. Had I been working in the capacity of a fireman, where it is necessary to both push and lift, I must have had a long period of disability. It has been only in the last month that I could sleep on my right side. At present there is very little deformity, slight enlargement of the outer end of the clavicle, where some small fragments of bone were detached with the ligament, but it is still tender and the function growing stronger.

Reduction and Treatment. No difficulty will be encountered in the speedy and complete reduction of this dislocation as the anatomic arrangement is such as to place little or no barriers in the way, unless it is a complete dislocation with the end of the clavicle thrust through the torn acromio-clavicular ligament. Pressure on the outer end of the clavicle with the elevation of the shoulder by pressure upward on the elbow will suffice to effect complete reduction in the simple cases.

Once the reduction is complete, very simple measures will retain it in position. A Stimson dressing is about the most perfect, and is highly recommended for its simplicity. It consists of a wide strip of adhesive plaster carried under and folded over the elbow, one end is carried up in front of the arm and over the external end of the clavicle and plastered to the back; the other end is carried up similarly posteriorly and the end plastered to the chest. This dressing can be reinforced by a Velpeau bandage or by a simple sling for the elbow and fore-arm.

This dressing, theoretically, is most beautiful and perfect, and will retain the parts in good position as long as it is kept tight and in position, but practically, it is most uncomfortable, and the patient will be constantly pulling and changing it. The weight and straps to the elbow may cause ulceration as well as being very annoying. My experience taught me that the holding of the arm in this position with the weight resting on the elbow and forearm is a most trying, painful and tiresome ordeal, and can only be appreciated by actual experience. It taught me further that the most restful position was on the back with all dressing removed and the forearm thrown over the chest. This, together with the massage, is one of the most important adjuncts to the usual treatment and will maintain the strength and nutrition of the arm and shoulder. It is a great comfort to the patient and will hasten the reparative process.

As railroad surgeons, we are confronted with the proposition of a slight injury producing a long period of disability, which is a great loss to the company and to the employe so injured. It is our duty to shorten, lessen or obviate this prolonged disability, as well as to serve science. How shall we meet this proposition? Shall we go on treating these cases in the same old way and let the disability stand against the company and the employe, or shall we institute new and radical methods that are consistent with our present light on the subject?

Reasoning from analogy and recent research, our duty points to the radical and open method of treating all these cases of severity. What the open method has done for the fractures of the patella and the patellar ligament can be more than expected for this injury. While I cannot speak from personal experience for this method, I am convinced that the open method done through an incision which parallels the fibers of the superior acromio-clavicular ligament with careful suturing of this ligament by the use of long-time catgut is the proper method in selected cases.

Charles L. Scudder* says that indications for operative intervention are, therefore, comparatively simple, namely: irreducibility and a failure to maintain reduction. The dislocation is irreducible because of the interposition of the torn capsule or of the ruptured trepezius muscle. The maintenance of reduction is impossible because of the rupture of the coraco-clavicular ligaments. At operation, therefore, the indications are to remove any interposed

*Journal American Medical Association, July 7, 1906.

parts and so to suture the torn ligaments as to restore the relation of the parts to their normal condition. He would formulate the treatment of a specific case somewhat as follows: If the dislocation is one of moderate degree, it should be treated by simple retentive apparatus. If extreme—in which case it is probable that the coraco-clavicular ligaments are torn—a suture of the part is indicated. If retentive apparatus does not hold cases of the first class then suture should be employed.

DISCUSSION.

Dr. W. Van Werden, Des Moines, Iowa: I wish to compliment the doctor on the paper. The subject is, from many points of view, one of the most interesting with which we have to deal. While it is true, no fracture is more easily adjusted than a fracture of the clavicle, I believe no one is harder to retain, and the amount of damages claimed for a small fracture is greater in the case of the clavicle than that of any other bone of equal size. Fracture of the clavicle is difficult to treat in railroad cases for this reason: In fractures in private practice we can expect the assistance and coöperation of the patient; in fracture of the clavicle in railroad cases, many times the patient does not want a good result—he prefers a poor result with slight deformity and the money he will perhaps be able to get, to a good result.

I had a case of this kind two years ago in which I adjusted the fragments every day for eight or nine days, as the patient removed the dressings, and I afterward ascertained from his wife that they were removed within half an hour or an hour after I put them on. No bandage that I have ever seen is comfortable in these cases, the average railway employe will not stand much pain, and so he takes it off because he is not caring particularly about the result. I finally refused to continue treatment and told him I would notify the company of the conditions, that I would not adjust the dressings unless he would leave them alone. The next day the dressing had been removed again and I refused to go back to the house. The wife came to the office in tears and begged me to come, promising that she would see that he did not remove the dressings any more. I put the dressing on again, and the following day I took him to the hospital and wired it. He took the bandage off and did all he could to bring about a poor result, but the result was perfect. I learned later that this man was so sure he would have a bad result and get several thousand dollars damages that he contracted for a farm and paid $50 down, expecting to buy the farm with what he would get on this deformity; but he had no deformity. This case serves to illustrate the difference in the attitude of private patients and corporation patients.

In regard to wiring, I do not believe there is anything in surgery which shows a more decided and permanent result than this. The mechanical fixation of the fragments by this means might even be compared favorably with the use of antitoxin in diphtheria. The only argument against it is the environment in certain cases, but if the patient is located where clean work can be done and asepsis maintained, suppuration will not follow. In a paper on this subject which I read before this association some time ago, I cited three cases in each of which the fractures were numerous—in one case the clavicle fractured in four places, in another three, another two. In these cases there was no alternative—it was impossible for the fragments to be held in position except by cutting down and using some kind of suture material, either kangaroo tendon, wires or pegs, and I am decidedly in favor of wiring. It was in this way that I learned the value of this treatment. I have wired fractures of the clavicle a number of times since, and several of my colleagues in Des Moines have been strongly converted to that method of repair. There is no objection to removing the wire after you are through with the operation—there is no danger of infection if it is removed under strict antiseptic precautions. With this method you can use whatever manner of bandaging you wish—the patient cannot get the fragments out of place if he tries.

Dr. H. Reineking, Milwaukee, Wis.: I was wishing while Dr. Van Werden was speaking that he would give us his experience with displacement of the outer end of the clavicle rather than with fractures. This is the subject we are interested in just now.

There will always be difficulty after reduction in retaining a displacement of the outer end of the clavicle, and I could not see from the paper just how this difficulty was going to be very much reduced by an open operation. It seems to me that the necessity for retention remains just the same, because the catgut ligatures are not going to hold the weight of the shoulder up—this will prevent retention in spite of suturing the ligaments with catgut. If we brought the bones thoroughly together and wired them in a proper manner, I can see that we might get enough retentive force there to help us in holding the shoulder in place. But even then the problem is the same—that of holding the shoulder up and keeping the end of the clavicle in its proper relation with the acromial process. I have had but a little experience with this class of cases, and I have found it impossible to retain the parts in the way usually advised, that is, running a broad adhesive strip under the elbow and over the outer end of the clavicle. Adhesive strips, no matter how wide we cut them, will always make undue pressure. But there is a way by which the elbow can be held up and more or less broad pressure made, and that is by the use of plaster-of-paris. Place a broad support, say of thick pasteboard, well padded, under the upper end of the forearm, and something similar over the outer end of the clavicle, also well padded, and let the plaster cover all. By this means we will not get pressure from the individual strips of bandage, but the pressure is brought to bear upon the stiff support. In that way I have succeeded in two cases of this displacement (the only ones I have had) in getting, not perfect anatomic results I will admit, but good functional results. I observed a case of this kind at a later stage in which open operation had been done, and unfortunately suppuration had occurred and spoiled the success of the operation. In that case displacement was more or less present, but even in that case the functional result was not bad and the man was able to resume his work as a molder in a foundry.

Dr. H. B. Hemenway, Evanston, Ill.: It is important in these cases that we make a correct diagnosis, if possible. For example, with displacement we may also have a fracture of the clavicle—the conditions are such that we are liable in these cases of displacement to get something a little out of the ordinary. I reported a case several years ago in which a man fell upon his hand and there was a slight displacement of the outer end of the clavicle, but the principal injury in that case was a fracture of the anatomic (not the surgical) neck of the scapula. The displacement of the outer end of the clavicle there was not an important matter.

In regard to that fracture I would say that it has been denied that such a case has been reported. A free discussion of this case was published in the *Journal of the American Medical Association*, I think, about 1888. A recent case that I had presented a fracture of the scapula, including fracture of the spine of the scapula, and with it there was displacement of the outer end of the clavicle. The presence of that fracture, no matter how slight, should, I believe, cut an important figure in the treatment of the case. I do not believe, as has been suggested, that our object in putting the strap under the elbow and over the shoulder, is to hold up the elbow; it is to shorten the distance from the tip of the clavicle at the outer end to the elbow. It does not make any difference whether the elbow is high or low, providing we keep the normal distance between the tip of the clavicle and the elbow. Simple straps or bandages on top of the clavicle are not sufficient, because, with that, the arm may be lowered.

This is not the point, nor is it sufficient to simply elevate the elbow, because you may elevate it, but still the tendency is for the outer end of the clavicle to push over the acromion. You have a fixed point on the clavicle, and that is at its junction with the sternum. The clavicle acts as a brace for the shoulder. If its outer end is displaced the brace of the shoulder is removed and the tendency is for the muscles to pull the shoulder forward, and if you have a muscular patient you are almost sure to have a continuance of that displacement in spite of all the pressure and straps you may apply under the elbow and over the clavicle. If, however, at the time you adjust these straps you also put on

a bandage or strap which pulls the shoulder backward, that holds the scapula in a position where the clavicle can readily slip into place and be easily retained, and in pulling the shoulder backward you generally want to pull the elbow forward in order to get as much purchase as possible.

I spoke of a recent case in which there was fracture of the scapula. Here the application of a bandage to pull the shoulder backwards was contraindicated, because it would tend to make the two fragments of the scapula override in such a way as to produce a deformity—it would tend to make a bend in the scapula. The case referred to was a little boy about 3 years old who fell on the sidewalk while playing and fractured the scapula. They sent for me and told me that he had sprained his wrist, and it was only after considerable time spent in examination that I could make a diagnosis, for the little fellow was badly frightened. There was nothing the matter with the forearm, the trouble, as stated, being fracture of the scapula with a slight displacement of the outer end of the clavicle. The case got along well.

A case that I examined recently was that of a young man who had an accident of this kind when he was a very small child, and the consequence is that, while the fracture is united, it is united with a tremendous bend; evidently he favored the shoulder while healing was taking place in such a way as to bend the scapula, in consequence of which a large callus formed so that he has a decided hump on his back, simply as a result of displacement of the fragments.

Dr. J. H. Rothwell, Liberty, Mo.: Several years ago I read a paper on this subject and described a dressing which was comfortable to a patient with displacement or fracture of the clavicle. In my experience the plaster dressing where it passes under the elbow is not well borne because of the suffering that it produces and because of the excoriation of the skin in many of the cases. It puts too much pressure on the point of the elbow. I described the dressing referred to several years ago, and I do not believe any one remembers it.

I put a pad of cotton into the axilla and between the arm and body, a heavy pad of cotton over the elbow and forearm, and then after reducing the displacement and getting the shoulder at the proper height I adjust an ordinary bandage, passing it under the elbow and over the opposite shoulder and then around the body so as to hold the arm perfectly still; it does not need to be applied very tight, but it holds the arm still and comfortable. After the ordinary bandage is applied, make a crinoline bandage, wet it and put it on; this adheres closely because of the starch. Then put the adhesive plaster over this dressing and over the shoulder in such a way as to hold down the acromial end of the clavicle. The plaster does not touch the skin anywhere except on top of the shoulder right over the displacement. The important point is this: When the crinoline is dry, and the dressing completely in place, take a brush and a little silicate of soda and paint the whole dressing, and you have one that cannot be displaced, the patient cannot get it off, and it is comfortable as long as it is necessary to wear it.

Dr. E. T. Wickham, Washington, Iowa: I recently had a case of displacement of the acromial end of the clavicle in which I learned a method of bandaging of a baseball player, who happened to be a neighbor of mine, and who showed me the contrivance. It is made in the form of a harness which fits over the shoulder and also around the body. I applied a compress over the displacement and then adjusted this harness, which fits snugly and keeps the shoulder in place. It has this advantage: That a man can be up and dressed with his arm in a sling, and it also has the advantage that after a certain length of time it can be worn without a support and no deformity result, as the shoulder is held in place.

Dr. Donald Macrae, Council Bluffs, Iowa: This is a subject I am somewhat famiilar with, and I am glad Dr. Murdy has brought it up. I am sorry the members of the society do not seem to see the point. I do not care anything about the method of applying the dressing—you may apply it as well as you can, keeping the head of the bone in proper apposition, three weeks, six weeks, three months, and at the end of that time, when the patient begins to work

again, it will work its way out. There is no sort of joint there at all, it is simply tied down with ligaments which are not prone to heal. I think the open method is the only sure way of preventing deformity, and I do not know that this is very sure. But catgut is by no means sufficient in these cases. Wiring with several wires is best, I think, leaving them in almost permanently, at least six months or a year, when they may be taken off. If you tie them with catgut the deformity will return—the ligaments will stretch, the tissue will give, and the displacement will show itself again.

I was interested in a suit for malpractice in a case of that kind, and I looked into the matter very closely. I find that the text-books assist the individual who is suing for malpractice in these cases, because they speak of putting on such and such a dressing and the result will be good. The functional result may be good, but the anatomic result is never a good one. Some time ago I had a case of displacement of the outer end of the clavicle in a young lady. She was very anxious there should be no deformity, because she went around evenings decolleté and did not want a point sticking out from the shoulder. I realized that the elbow bandage would be inefficient, so I took a board an inch thick, just wide enough to lie between the scapulæ, and extending from the head to the sacrum. Across that was applied another board opposite the shoulder, when one board was nailed to the other. The long board extending along the spine was fastened there with adhesive plaster, and then the shoulder was tied back to this cross—it was absolutely "nailed to the cross" and held there. There was no trouble at all. The bandages were well padded on the anterior aspect of the shoulder, and the parts were in absolute position as long as that was there, which was six weeks. There was no deformity for about a week after the dressings were removed, but after this I began to see the deformity again. The only sure way to get absolutely no deformity is to cut down, and even then we cannot be sure.

So I would like that the sentiment of this society show whether it is possible for a perfect anatomic result in cases of this kind. Complicated cases give us no after-troubles, the patient expects deformity; but I take it that simple displacement of the end of the clavicle, leaving a disagreeable deformity of that kind, was the object of that paper.

Dr. Van Werden: I wish to state that in those cases catgut is absolutely a failure; no matter how it is applied, it will not retain the displacement in position—it will give, it will slide.

Dr. Murdy (closing): I am very much obliged for this free and full discussion. The points of the paper that I wished to emphasize were that slight injury will produce this displacement, which is often followed by a long period of disability, and, in a great many cases, deformity. And while I touched on the treatment of this injury, I was speaking largely of the general principles of treatment, not of details—it is immaterial really what dressing we use so it is a dressing that keeps the bones properly adjusted; and when I was speaking of the open method of treatment and of catgut I further was speaking of principles, gentlemen. While I believe that in a great many cases catgut will be sufficient to hold the ligaments and retain the displacement, there might be cases of very great displacement in which it would be better to wire, and it might be better in some cases even where you are wiring the ligaments to further wire the outer end of the clavicle to the acromion; that is recommended, and I believe it is a recognized method and is probably the better method to use in cases of severity.

In the intoxications *venesection* is an important therapeutic agent, in particular in cases of poison which concentrate themselves in the blood and directly affect it. As much as 300-400 cc. may be drawn off from patients suffering from the effects of the inhalations of poisonous gases: sulphuretted hydrogen, coal gas, carbonic oxid, hydrocyanic acid and nitrous oxid. The risks of the blood letting are minimal compared to those to which such patients are exposed, particularly if followed immediately by transfusion of saline; the risks are greatest in anemic and least in full-blooded individuals.—*Schlesinger.*

HEATING AND VENTILATING OF CARS.*

E. R. SWAN, CEDAR RAPIDS, IOWA.

The heating and ventilating of cars has received but little attention from those versed in the science of ventilation. What little has been done appears to have been by persons of no experience or knowledge of the principles that must be applied in order to secure it. Heating and ventilating has not been considered as a science of itself, and yet it is one of the most difficult problems in engineering.

Dr. Dudley, chemist, who designed the system of ventilating used on the Pennsylvania Railway, in writing upon the subject, says, in part:

"It seems not improbable that if a vote of the general traveling public could be taken on the question as to what improvement or change in passenger cars at the present time would most conduce to the comfort of passenger travel, a very large majority of the ballots would be in favor of an improvement in car ventilation.

"It is to be confessed that the discomfort attendant on riding a number of hours in a stuffy, overheated passenger car and especially the annoyance and discomfort from spending the night in an overheated, ill-ventilated sleeping-car, are so great that it is not at all surprising that not only individual passengers but also technical papers, and indeed the general press of the country, should from time to time break out into a tirade against the present condition of ventilation of passenger cars. Few problems in engineering have ever been undertaken which are so fraught with difficulties as the ventilation of cars on railroads. To supply them with the proper amount of fresh air throughout the year, and at the same time to exclude from them objectionable matter, such as smoke, cinders and dust, certainly here are difficulties enough. The shape of the car itself, the very small space compared with the large number of people, the question of keeping people warm, and the exclusion of objectionable matter from them, each one of these items is a problem in itself, sufficiently difficult to tax the skill of the best experts, and, when all combined in one, it is little wonder, apparently, that progress has been so slow.

"Is it necessary to ventilate cars both winter and summer? It would naturally be expected that the doors and windows would be sufficiently satisfactory source of fresh air in the summer season, and that, therefore, it would only be necessary to study the subject of car ventilation for the winter.

"Unfortunately, part of the problem, as already stated, is to exclude objectionable matter coming from without, and on dusty roads it is absolutely essential, even in warm weather, to keep the doors and windows closed on account of dust. Furthermore, smoke and cinders from the locomotive not infrequently are annoying even in the summer season, so that it seems fairly probable that a good system of ventilation should be operated both in winter and in summer. It has been urged in the technical press, and in conversation with would-be experts, that it is an easy matter to ventilate cars; simply let air in and provide places for the foul air to get out. I am compelled to say that I think this is a very unsatisfactory view of the case. In this climate it is unendurable to let fresh air into cars in proper amount in the winter season without warming it, and consequently it is perfectly clear that studies on ventilation must at the same time take into account the heating system of the car. Some systems of car ventilation, if they may be called systems, are little more than apertures in the car, and some so-called systems simply attempt to exhaust air from the car without providing inlets. So far as my knowledge goes, the experience with these systems is that neither of them can be used for any length of time; one can stand a little cold air for a few minutes, but when we come to consider the amount of air required, it is little short of an absurdity to attempt to ventilate a car without at the same time warming the air."

True and successful ventilation consists in the free access of warm, pure air into the car, and the escape of bad or vitiated air therefrom. If the air is filled with dust, smoke and other objectionable matter, it cannot be said to be pure, and it must be excluded. *Cold draughts must* be avoided, and a constant volume of fresh air supplied without fluctuation. Economy of operation is important, but must not be at the expense of efficiency. *We must at all hazards* avoid under-ventilation which is at the expense of health, and should avoid over-ventilation for the sake of the pocketbook.

The first attempt at improvement in the ventilation of cars was with the deck which was put

*Presented at the summer meeting American Association of Heating and Ventilating Engineers, Milwaukee, Wis., 1907.

on the car for that purpose. This was before there were any systematic studies made of the subject of ventilation. While it is impracticable, the railroad companies appear to be unwilling to give up the idea, and nearly every attempt made to improve the ventilation has been done in connection with the deck, and no attempt made to warm the air before it enters the car. The deck could very well be omitted from the car so far as ventilation is concerned, as the ventilation of a car through the deck windows or any contrivance to be used in place of them is a fallacy, as the entering or outgoing air depends wholly upon the direction and velocity of the wind. If the windows are open, the air will enter only on the windward side and

Fig. 1.

escape on the leeward side. Whether it will descend downward into the main body of the car will depend not only upon the difference in temperature of the interior and exterior, but upon the velocity at which it enters the car. The windows are hinged at the bottom and swing inward, and the entering air is deflected upward and across the ceiling until it meets resistance, when it will descend against the leeward window which will deflect it out of the car. As shown in Fig. 1, some small portion will descend to the floor and be drawn across the feet and through the filth that may be on the passengers' shoes or the floor to the heaters, and when warmed pass upward to the breathing line loaded with impurities from the breath, persons and floor. The wire filter placed over the window openings, unless carefully attended to and cleaned, will choke up so the air cannot pass through. If the windows are closed on the leeward side, the cold air will descend and cause cold and unpleasant draughts, and will also cause a pressure in the car which will be governed by the velocity of entering air; when the pressure in the car is greater than the exterior windward sides, the air will be forced back through the windows and the fluctuating winds seesaw back and forth through the windows. The speed of the car will have no material effect on the entering air; it will depend entirely on the cross currents. If there are no cross currents there will be no entering air, and if there are cross currents the volume will depend upon the velocity of the cross winds.

The same things apply to summer ventilation of cars, except that the exterior and interior air will be so near the same temperature that the incoming air will not descend of its own accord, but only as it is forced down. If the windows in the lower part of the car be open for ventilation the cross currents will carry the breath of the person on the windward end of the seat directly across the face of the person sitting on the leeward end of the seat. Hence, ventilation of cars should be done by downward currents only.

If the ventilation must be done through windows, the windows should be opened at the rear end of the car on the windward side and at the front end and on the leeward side; but this will not and cannot successfully and satisfactorily ventilate a car, as the force of the moving current will cause the air to pass to the leeward side and forward to the outlet, where it will escape without thorough distribution, which is necessary for successful ventilation. No car or room can be successfully ventilated through the windows, winter or summer; windows must be closed on the windward side in case of strong winds, rain or dust storms, and only a seesawing effect will be produced through the windows on the leeward side. Hence, neither cars nor buildings should depend wholly upon windows for ventilation.

If the windows are open in the deck it is no proof that fresh air is entering the car. The winds may be in the wrong direction, or the wire screen choked so that the air cannot pass through. The only sure proof that the fresh air is entering the car will be in the cold draughts it will cause. Usually the person in charge does not consider the opening and closing of the windows in connection with ventilation, but to control the temperature. If the car is too warm the windows are opened, if too cold

they are closed. No system of ventilation can be a success unless the air is warmed before it enters the car. It will not cost as much to warm the air before it enters the car as it will to warm it after it is in the car. It is a well-established fact that more air can be warmed by passing it over the heaters reasonably fast than at a slow movement. John P. Fox, a railway engineer, says that, according to a test made by the street railway company, it took 35 per cent less current to heat a car, if some of the current were diverted to a fan blowing outside air through the heaters.

No car ventilator which is placed in the side of the deck or which does not warm the air before it enters the car is worth considering. The only one that we know of that has any claim to merit is the Dudley system. Pure air is taken in through two hoods at diagonally opposite corners. This air is conducted downward to longitudinal open spaces underneath the car. Through these spaces the air passes until it reaches apertures through the floor, whence it flows upward over heated steam pipes and out into the body of the car through large tubes placed under each seat, the foul air is removed through several ventilators placed on the roof of the car, the air supply is controlled by opening and closing the ventilators. While Dr. Dudley does not apply the principles used by the heating and ventilating engineers in using the upward system of ventilation, and the control of the volume is in the outlets instead of the inlets, it is, however, far ahead of the other so-called systems. Both the inlets and outlets should be operated to secure good results. While Dr. Dudley recognizes the importance of excluding dust and smoke from the car, he has made no provisions to prevent it only by placing the intake above the top of the car.

If we have successful ventilation, the fresh air *must* be warmed before it enters the main body of the car, and this can be done only with some system of indirect heating, and the volume of air required will be governed by the proper location of the inlets and outlets. A large volume of air may be admitted into the car, and, if allowed to escape without proper circulation, very little benefit will be derived and much fuel wasted. Let us quote from "Heating and Ventilation of Buildings," by Professor Carpenter, Past President of American Society of Heating and Ventilating Engineers and Professor of Experimental Engineering, Cornell University:

"The introduction of pure air can only be done properly in connection with the system of heating, and any system of heating is incomplete and imperfect which does not provide a proper supply of fresh air. The advantages of introducing warm air at or near the top of the room are, first, the warmer air tends to rise, and hence spreads uniformly under the ceiling; second, it gradually displaces other air, and the room becomes filled with pure air without sensible currents or draughts; third, the cooler air sinks to the bottom and can be taken off by a ventilating shaft."

So far as the system introduces air at the top of a room, it is forced distribution, and produces better results than other methods. When the inlet is placed in the floor, or near the bottom part of the wall, it is a receptacle for dust from the room, and a lodging place and breeding place for microbe organisms. "The outlet for foul air should be as near the bottom as possible."

Mr. Joseph A. Moore, Inspector of Public Buildings for Massachusetts, and who has been engaged for the past twenty years supervising and testing heating and ventilating of school buildings, after inspecting and experimenting on hundreds of buildings, says in his volume "The School House":

"In cold weather the fresh air must be warmed to a number of degrees above the temperature at which we wish to have the rooms at the breathing line. Heated air will go to the top of the room, no matter where we admit it, and its distribution will begin there. By leading it there in pipes or flues we avoid carrying up dust and foul air with it, and we can locate the inlet and direct the flow of air so as to distribute it more evenly than if we admit it at the floor. The air will spread over the ceiling, the falling current, caused by cooling, descends to the floor, and may be best taken out at the bottom of the room. If the air is admitted at the floor and taken out at the ceiling, there is established a current between the inlet and the outlet, leaving the foul air in some parts of the room almost unmoved, and only slowly and partly drawn into the current, and the great loss of

heat necessitated thereby calls for the consumption of a much greater quantity of fuel. The hot air is drawn off rapidly from the top, while the cold air remains at the bottom of the room. A school room supplied with 1,500 cubic feet of air per minute, with properly located fresh, warm air inlets and foul air vent flues, will have the air at the breathing plane kept as pure as it will be when supplied with 2,500 cubic feet per minute, with no proper provision for circulating the air.

"The economy of heating and forcing this extra 1,000 cubic feet of air into a room has never been satisfactorily explained."

Professor Carpenter and Mr. Moore are certainly experts in heating and ventilation. While they treat on the subject of ventilation of buildings, the same principles must be applied to cars for successful ventilation.

We do not purpose to advocate any particular standard of purity, but will leave that to the medical profession to determine. The quantity of air required will depend upon circumstances. When many persons are confined in a small space, like a car, not as much fresh air will be required as in a large space, where the foul air diffuses with the fresh air before its removal.

The tendency of a person's breath is downward, and by bringing in the warm air at the top of the car and removing it at the bottom, the air, as it descends to the breathing line, is all fresh, and as soon as we introduce sufficient air into the car to maintain a downward current it will not matter whether there are 30 or 60 passengers in the car, they will have pure air to breathe, the air will not be contaminated in the least; the diffusion of the gases takes place slowly, and before it can diffuse upward to above the breathing line it will have passed out of the car. Some writers claim that the tendency of the breath is upward. I *cannot* see how this can be. When the air is expended from the nostrils it is started downward, unless you are standing on your head. Carbonic acid is said to be 22 to 26 times heavier than hydrogen; now what is there to cause it to raise except as it diffuses with the air; then there is not enough difference in temperature between the expired air and the air in a warm car to cause it to change its course in an upward direction. If this is true, why need we put in such a large volume of air? Is it not enough if we *maintain* a downward current of air? I am not taking into consideration the vitiated air from lamps, that we know flows upward on account of extreme heat, and is started upward at a rapid velocity, and should be removed from the car independent of the ventilating system. In ventilating cars or buildings, two important matters must be taken into consideration. Under ventilation, which is at the expense of health, and over ventilation, which is at a money expense, both should be guarded against. Every cubic foot of air heated above that which is required for ventilation is at a money loss. If we heat 2,000 cubic feet of air when only 1,000 cubic feet is required, the extra expense for fuel will be enormous. Fluctuations are more liable to occur in cars owing to the variable changes in speed than in buildings, but in winter weather larger variations are bound to occur, and there will be but very little time in either cars or buildings but what there will be either under ventilation or over ventilation if the apparatus is controlled by hand. It is utterly impossible to regulate the air supply by hand. A man may have only one inlet to look after, and nothing else to do, and he cannot prevent fluctuations. The only thing he can do is to guess at it. If he is a good guesser he will come nearer than would a poor guesser. Hand regulation is all guesswork.

There is only one way to prevent fluctuations and waste, and that is automatic control of the air supply. Several attempts have been made to design an automatic control of the air supply. Figs. 2, 3 and 4 is a system designed by the writer of an automatic control for the air supply and the inlet and outlet for car ventilation. Fig. 2 is a vertical end view, with the lower portion of the casing removed. Fig. 3 is a vertical side view, with the casing removed. Fig. 4 is an automatic outlet for foul air. (The numerals refer to the same parts in either figure.)

In describing the devices and referring to the drawings, numeral 1 designates the top of the car, and numeral 2 the bottom of the car.

The apparatus is arranged between the top and bottom of the car at either end. In a

combination car it can be located at the partition, and will heat and ventilate both compartments with the one apparatus.

Numeral 3 is the intake for fresh air located on top of the car; numeral 4 is an automatic movable valve, which moves on track 5 located on the inner side and near the top of 3; 6 is the downtake pipe, opened at the lower end and

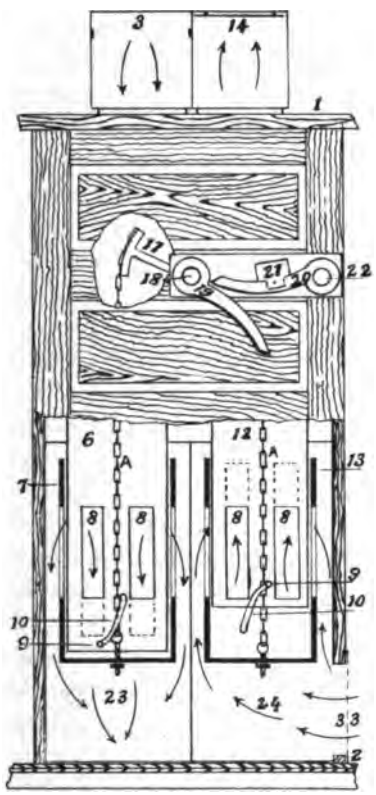

Fig. 2.

provided with a plurality of vertical openings or slots (8) near the lower end.

The passage of air is governed by valve 7, which is mounted for movement longitudinally and rotary, and which receives the lower portion of pipe 6; 7 has corresponding openings, as in 6, and registers therewith. The openings in 6, however, are somewhat longer than in 7, in order to maintain the same vertical length in slots 8 when 7 is forced downward by the pressure of the inrushing air. The rotary movement is produced by pin 9, which is attached to pipe 6, and extends outward through the spiral slot 10. Pipe 12 and valve 13 are constructed in the same manner. Pipe 12 is the foul air outlet, and has connection with 14, in which is located two automatic dampers 15 connected by rod 16.

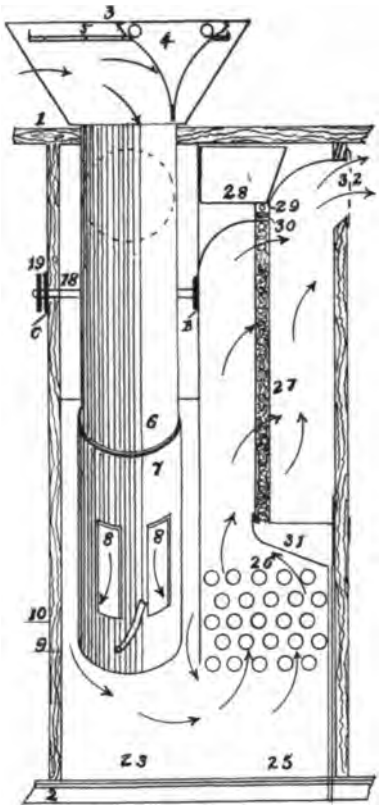

Fig. 3.

Valves 7 and 13 are connected to a cross arm 17 by a flexible connection "A." 17 is firmly attached to shaft 18, which operates in suitable

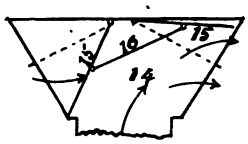

Fig. 4.

bearings "B" and "C." Valves 17 and 13 being attached to opposite ends of lever 17 balance each other. The downward movement of valve 7 causes an upward movement of valve 13.

An important feature of the apparatus is the special means utilized in order that the quantity of air admitted to the car may be certain and not subject to variation, due to the varia-

tion in the speed of the car. To accomplish the above peculiar regulating mechanism for governing the movement of the valves 6 and 13 is employed. This regulating mechanism includes the arm 19, attached to the end of the shaft 18 for movement therewith, and curving outwardly and downwardly from said shaft. Arranged to connect with the upper surface of the arm 19 is a weighted lever 20, which is pivoted at one end, as shown at 22. 21 is an adjustable, slidable weight, the position of which may be fixed with a suitable set screw. The coöperation of 19 and 20 is as follows:

Normally, the outer end portion of the lever 20 bears against the arm 19 near the point of connection of the latter with shaft 18. When the car begins to move the amount of fresh air passing down the fresh-air flue 6 increases in direct ratio to the increase in the speed of the car; on the increase of the velocity of the air passing into the flue 6, the increased pressure due to the increased velocity of such air, with regard to valve 7 is resisted by the regulating means, for the reason that the connection "A" between the valve 7 and the lever 17 begins to pull downwardly on said lever, thereby gradually raising the arm 19 and gradually causing the inner end of the lever 20 to approach the outer end of said arm 19.

At the point of contact of the lever 20 approaches the outer end of the arm 19, it becomes obvious that said lever 20 obtains a greater leverage with respect to the arm 19, and the weight brought to bear on arm 19 gradually increases, due to the increased velocity of air pouring into the flue 6, causing a gradual downward movement of valve 7, which movement is retarded and is resisted by a gradual increasing weight connected with the valve for that purpose. As the area of the opening 8 decreases, as the velocity of the air in flue 6 increases, the quantity of fresh air passing into the car will be certain, with no fluctuation of the fresh air.

The quantity of foul air withdrawn from the car through the foul-air pipe 12 is also proportionate with the velocity of air passing into the flue 6, as the amount of suction in the passage 14 depends and is proportionate with the velocity of air. As the velocity of the air entering flue 6 decreases, because of the slowing down of the speed of the car, the pressure of air on the bottom of the valve 7 decreases and the same move upwardly, under the influence of the weighted lever 20, decreasing as the point of contact of these parts approach the shaft 18.

The valve 6 is placed in compartment 23, and valve 12 in compartment 24, the indirect heating 26, and the air washer 27 are placed in compartment 25. The air washer 27 may be of any substantial form which embodies spaced sides, between which is located the filtering material, which may be excelsior or the like. Aluminum excelsior would be preferable. The filtering material is kept in a moist condition by being supplied with water from tank 28, or by any other suitable means (from one to two gallons per hour will be required), through a small perforated pipe 29, with a suitable bib for regulating the water supply. Cotton or similar spreading absorbent substance, as indicated at 30, should be located at the upper portion of the filtering material, just below the pipe 29; said cotton or material effectively spreading the moistening fluid over the filtering material. A drip pan 31 is connected to the lower end of the filter 27, receiving the dirt washed from the air. A suitable pipe is connected to the drip pan and through the bottom of the car, through which all dirty water and filth passes out of the car.

34 is a revolving door to be used when warming up the car or when not occupied.

35 are dampers located near to top of pipes 6 and 12, to close the inlet and outlet when 34 is used for revolving the air or when passing through a tunnel.

Generally describing the operation, it will be obvious that as the car commences to move the air will pass into the intake 3, nearer the direction in which the car is traveling. The inrush of air will exert a pressure against the valve 4 and move it to the leeward side of the pipe 6, and deflect the air downward in pipe 6 to the end of the passage and exert a pressure against the bottom of valve 7, until it closes the openings 8 in flue 6 and 12 to a predetermined extent. The fresh air passes through the open-

ings 8, and follows in the lines indicated by arrows through the heaters 26 and the air washer 27 into the car at 32.

While the fresh air is being admitted to the car, as above described, the foul air is being removed through the opening 33, at the floor line and upward through the openings 8 and pipe 12, and through the foul-air outlet 13 at the leeward end. Dampers 15 in outlet 14 (Fig. 4) are automatic. When the car is moving the pressure of the air on the windward damper 15 forces it downward and raises the leeward damper 15 horizontally, opening the passage to the leeward end. The fresh entering air and the outgoing foul air will be proportionate, and there will be no vacuum in the car. A slight plenum should be maintained at all times. This is very important if we wish to avoid cold draughts through cracks and crevices. The wind will have the same effect as the moving car. If the wind is moving in the same direction and faster than the car is traveling, the valves and dampers will be forced to the proper position to receive fresh air and to expel foul air, and will always maintain the air supply.

The intake, the outlet and the volume of air are automatically controlled and need no attention whatever, and it is the only ventilator that automatically controls the air supply to a certain quantity. The same amount of air will enter the car under all conditions after a speed of ten miles is obtained. It is a combined system of plenum and exhaust, using the movement of the car for power instead of a fan. In cold weather the heaters will always cause a circulation of air, and some ventilation (about 5/8) will always take place when the car is standing.

Dusty air must be, of necessity, a dry air. By passing it through the filter all dust and other obnoxious matter will be removed and the *humidity* will be greatly improved.

At a speed of ten miles per hour the air pressure is one-half pound per square foot, and the slots 8 are wide open. As the speed of the car increases the slots gradually close, which reduces the air supply. When a speed of 20 miles is reached the pressure is 2 pounds per square foot and the openings are closed one-half, which allows the same quantity of air to pass as at 10 miles per hour. At 40 miles per hour the pressure is 8 pounds per square foot, and the slots 8 are closed three-fourths. At 80 miles per hour the pressure is 32 pounds per square foot, and the openings are closed seven-eighths of the way, and the same volume of air will pass through at any rate of speed.

It will be seen that the supply of air is under perfect control, and over ventilating cannot take place; hence, there will be a large saving in the expense for fuel. It seems to be the opinion of some that a fan will supply a constant volume of air at all times. This is an erroneous idea. If there is sufficient wind to cause a plenum in the fresh-air compartment the fan will deliver more air than when it is normal, or a vacuum in the fresh-air compartment, and there will be fluctuations of the air supply and under or over ventilation. It would be interesting to know how much is wasted by over ventilation.

It has been suggested that fans be used in car ventilation. Fans would be of no use, except when the car was moving very slowly or standing still. As soon as the speed of the car is greater than the velocity of the air driven by the fan it would be of no advantage. Usually, when the car is standing the doors are open, and thorough distribution will not take place, in any event. If the inlet for fresh air faces the direction the car is moving and the outlet toward the rear, the movement of the car will produce the same result as a fan.

It is generally considered that there is more excuse in car ventilation, and that it is more difficult than the ventilation of buildings. We do not think that that is the case. In building ventilation there is never a fixed point to work from. The wind is changeable, and it is not known one day from what direction the wind will be next day, whether the wind will blow into the inlet or siphon the air out. With a car it is different. We are always sure of the air entering the inlet if it faces in the direction the car is moving. If the wind should blow in the direction and faster than the car is moving by using an automatic intake which changes

the position of the intake to conform with the direction of the wind, we would still have an air supply passing into the car. Cross winds will not affect it, no more than the movement of the cars affects the air supply passing into the windows in the side of the car. When we have once designed a perfect system for a car it can be applied to all cars. Not so with a building. Each and every one is a different proposition. Even in duplicate buildings outside conditions and locations of buildings or trees will change the direction of the air currents, and different engineering will be required.

The reason car ventilation has not been more successful is the heating and ventilation has not been considered a science, and the ventilating engineer has not been called upon to solve the problem, but it has been left to men who, though they may be versed in the other sciences, may know nothing of the principles of ventilation. Many technical writers and others appear to think that all that is necessary is a hole in the side of the car. Some of them advocate two holes, and think that is all that is required. They do not appear to understand that the air must be moved, and some kind of force or power is required to move it. A very simple experiment would soon convince them. If they will open their mouths as wide as possible and stop expanding and contracting their lungs for five minutes, they will be convinced that something is required more than the holes. They would be dead, and that ought to convince them that the theory is wrong; but it might not.

Whether cars will ever be properly ventilated will depend upon the operating companies or the law-makers. That it can be done there is no doubt, and the expense would be nominal. One cent for each passenger carried on the railroads for one year would ventilate every passenger car in the United States, and the saving of fuel would more than repay the expense in three or four years. It would seem that no better time could be selected to introduce ventilation upon the railroads than the present time. Hundreds of steel cars are being, or about to be, built which will not be ventilated any better than the cars now in use. While I am not an authority on car building, it would seem to me that the deck might be left off and a large saving made. The deck is of no use as a ventilator, and surely does not add to the beauty of the interior of the car. The extra cost of building the deck would ventilate a dozen or more cars. Conditions are much worse than they were before the vestibule cars were introduced, as opening the doors does not materially help the ventilation. The opening of doors between cars only allows the impure air to drift from one car to another. More complaint is made about the sleeping cars than coaches, yet the chair cars and coaches are worse than the sleepers, for the reason that many more people are in them and the breathing space is at least 50 per cent less. Surely the poor man or woman who is obliged for the lack of funds to ride in the coach is as much entitled to pure air to breathe as is the wealthy passenger who rides in the Pullman. Fresh air is too cheap, the supply is too large to be stingy of it, and health is too important to be deprived of it.

INJURIES OF THE CORNEA AND NEIGHBORING STRUCTURES.

BY S. J. TOURNEY, M. D.

A superficial abrasion of the cornea causes much pain with watering of the eye, photophobia and ciliary congestion. These abrasions are frequently due to scratches, often inflicted by the finger nail or flying foreign bodies. The abraded surface is often small and shows no opacity and at times even difficult to detect by watching the reflection of a window from the cornea while the patient moves the eye about. Many, if not all, the cases of relapsing bullæ of the cornea seem to have originated in slight superficial injuries. Again, the injuring agent may be a fragment of metal or stone flying from tools. These become imbedded in the cornea and give rise to various degrees of irritability and pain. The fragment soon becomes surrounded by a hazy zone of infiltrate. The pupil is nearly always slightly contracted. The color of the iris is altered, indicating a congestion.

Another frequent source of injury to the cor-

nea and neighboring structures are burns resulting from strong alkalies, of which lime is the most common. As the full effect of a lime burn is not apparent for some days, a guarded prognosis should always be given in the early stage. A burn of the cornea under such conditions may manifest itself by infiltration alone and subside under treatment, or it may pass into a suppurative keratitis with hypopyon, scarring and shortening of the conjunctiva (symblepharon). The most superficial burns whiten and dry the surface, and in a few hours the epithelial layer is shed. This is shown by a sharply outlined, slightly depressed area of corneal surface. If the damage be slight and recent the surface is clear, but more or less opalescent if the case be a few days old and the burn be deep enough to have caused destruc- of Bowman's membrane and true cornea tissue.

But of all injuries to the cornea the most serious, as well as the most treacherous, of the entire category are penetrating wounds. It is not the wound itself that makes it such a serious matter, and so much dreaded, as it is the possible complications resulting from injury to the neighboring structures. So when a patient presents himself with a penetrating injury to the cornea, we should ascertain the seat, extent and character of the wound; the interval since the injury, and test the sight of the eye, also taking cognizance of the tension; then find out all we can about the wounding body, and especially whether any fragment has been left within the eyeball. Penetrating wounds are least serious when they implicate the cornea alone or the sclera behind the ciliary body, that is ¼ inch from the corneal margin. Corneal wounds without injury to the iris or lens, and without prolapse to the iris generally do well. Penetrating wounds which cause laceration of the iris, with prolapse and puncture of the lens, are indeed a most serious complication. Traumatic cataract resulting therefrom is liable in its swollen state to press upon the ciliary processes and cause grave symptoms with hemorrhage into the vitreous, and within a few days purulent inflammation may destroy the eye, or result in sympathetic ophthalmia.

These cases must be viewed from two standpoints: First, the danger to the injured eye; second, the risk to the sound eye. The question whether to sacrifice or attempt to save the former, is very difficult at times to decide. If the wound lies wholly or partly in the danger zone, and is so complicated with the injury to the deeper parts, and no hope of useful sight remains, enucleation is indicated. Again, if the wound be small and lies in the danger zone, and already a serious iritis is set up, enucleation is indicated.

There is a large class of cases in which the foreign body remains in the eye, though the injury of itself is not fatal to sight and has not as yet led to inflammation. These cases should be kept under close observation until the eye quiets down completely.

In conclusion, let me say that it is the imperative duty of the attending physician to make, or have made, a careful and painstaking examination of each and every case of corneal injury, investigating the extent and gravity of such injury, acquainting the patient with the probable prognosis, and advising proper treatment. In doing this be independent, firm, yet kind.—*Medical Sentinel.*

SOUTHERN PACIFIC HOSPITAL.

The Southern Pacific company is to erect a magnificent hospital on a block of land opposite the pan handle at the entrance to the park, San Francisco. The land cost $200,000 and the hospital is to cost a quarter of a million or more.

It is sometimes necessary to operate on *hemophilics,* and cases are on record where the arrest of hemorrhage has not presented the difficulties anticipated. No operation will, however, be done that is not absolutely of vital importance. Calcium chlorid should be administered beforehand in order to aid local hemostasis.—*Schlesinger.*

Amputations of the thumb are not often necessary, as, owing to its great mobility, it escapes injuries which are commonly met with in the other digits. Again, the large vascular supply to the thumb renders conservative surgery more successful, and so, instead of amputations being necessary, partial operations usually suffice.—*Wheeler.*

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Next annual meeting, Chicago, October 16, 17, 18, 1907.

THE ANNUAL MEETING.

On another page of this issue will be found the list of delegates appointed thus far. The October number of THE RAILWAY SURGICAL JOURNAL, which will, as usual, be issued early, will contain further details.

The fourth annual meeting of the American Association of Railway Surgeons will be held in the Palmer House, southeast corner of State and Monroe streets, Chicago, on October 16, 17 and 18, 1907.

[The room in which the meetings will be held is the Ladies' Ordinary, the same one which was used last year.]

NOTICE TO MEMBERS.

On account of the uncertainty existing as to the effect of recent legislation on transportation, work on the program for the October meeting of the American Association of Railway Surgeons has been delayed. It is now understood the railways entering Chicago will furnish transportation to their own surgeons, but transportation on other roads will be granted only to such surgeons as receive a stipulated salary, and whose entire time may be at the command of the company.

The distinction between different classes of members will be ignored and every surgeon who holds any kind of membership is urgently requested to contribute if possible to the interest of the meeting, if not in the way of a paper at least by his presence.

D. S. F.

A NEW CAUSE FOR DAMAGE SUITS.

It has remained for a citizen of the Hoosier State to discover a new cause for damages. He alleges that while on an excursion on the Big Four road he was pulled out of his seat by an employe of the company and roughly treated. He was accompanied by the girl to whom he was engaged, and she was so indignant because he did not resent the affront, which he could not have done without danger to others, that she jilted him then and there. He says that owing to the illegal act of the company's employe he was not only humiliated but suffered the loss of the affections of a woman whom he dearly loved. Yet he only asks $3,000 damages!

Miscellaneous

LIST OF DELEGATES TO THE FOURTH ANNUAL MEETING AMERICAN ASSOCIATION OF RAILWAY SURGEONS, CHICAGO, OCTOBER 16, 17 AND 18, 1907.

ILLINOIS CENTRAL RAILWAY.

Drs.

H. H. Hughes, Jackson, Miss.
C. S. Priestley, Canton, Miss.
J. C. Armstrong, Water Valley, Miss.
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A TEST TUBE HOLDER.

In boiling urine over the alcohol lamp many physicians use for a holder a scrap of paper folded and placed around the tube. This generally proves unsatisfactory, since when the urine boils over the paper gets soaked, the fingers get scalded, and sometimes the test tube is dropped before the test is completed. The average tube holders on the market get out of order easily. The best tube holder is a piece of harness leather about one-half or three-quarters inch wide. Bend this around the test tube and grasp the two ends between the finger and thumb. After being used a few times on the hot test tubes, it retains its shape and can be left on one or another of them when not in use. It is simple, durable, efficient and cheap.

CHRISTIAN SCIENCE IN TEXAS.

Mrs. Travis was a passenger on one of the street cars of Fort Worth. Ejected from the car, she sued the company for heavy damages for "physical and mental suffering." At the trial the attorneys for the railway company set up as a defense that Mrs. Travis was a disciple of Mary Baker Eddy and had for years exposed the cause of Christian Science. Therefore, Christian Science, denying the very existence of physical and mental suffering, it was impossible for the woman to sue on such grounds. This point was overruled by the judge of the lower court and the jury returned a verdict for damages. The attorneys for the corporation then appealed to the Supreme Court of Texas, and this tribunal reversed the finding of the lower court, saying that if Mrs. Travis had such "control of her feelings, or thought she had, as to render her insensible to pain when she willed to be, we see no reason why that circumstance should not have been considered by the jury in determining the extent of her suffering and compensation to be made on account of it." This certainly establishes an interesting precedent.

Translations

KINEPLASTIC AMPUTATIONS OF THE UPPER EXTREMITY.

BY PROF. ANTONIO CECI,
Director of the Surgical Clinic in the University of Pisa, Italy.

[Translated for THE RAILWAY SURGICAL JOURNAL.]

I deem it beneficial to the profession to present a new method of amputation of the upper extremity, which I performed according to the ideas of Dr. G. Vanghetti, a practicing physician of Empoli, Italy.

Ten years ago, M. Vanghetti, as the result of experiments carried out on chickens, conceived and formulated the idea of using the muscles and tendons which had been left intact after crushing injuries or in amputation stumps. This with a view to forming living motors in the shape of a ring or a club-shaped mass, such motors enabling the stump to move in turn a more or less complicated artificial hand.

The doctor was enthusiastic and accordingly sent a written account of his method to several surgeons, myself among the number. I was greatly pleased with this account, and secured its publication in the *Archivio d'Ortopedia*. I also promised him to put his idea into practice, whenever the opportunity presented itself. This happened on but three occasions since amputations are happily very rare nowadays.

In later publications Dr. Vanghetti elaborated his theory and christened it "plastic amputation" or "kinematic prosthesis." It seems to me it would be more exact to call it "plastico-kinematic" or "plastico-orthopedic amputation" or—for short—"kineplastic amputation," calling the method as a whole "kineplasty."

The author has treated his subject in too theoretic a manner; many of his propositions are not practical. The fundamental idea, however, of M. Vanghetti is really most original, and deserves a place in contemporary surgical technic.

I have carried this method out in three cases, and obtained really marvelous results in two of them. One case concerned an amputation of

the arm through the upper third, with a ring-shaped motor obtained by suture of the biceps and triceps tendons. The other two cases were amputations through the upper third of the forearm. In one of these a single loop was made from the flexor tendons sutured to the extensor tendons. In the other two loops were formed, one on the dorsal side from the extensor tendons, the other on the ventral side from the flexor tendons.

Case 1. G. P., aged 33 entered the clinic early in December, 1900. He had had his right arm caught in the cogs of a turbine, sustaining wounds and contusions, which obliged him to stay in a hospital four months. Some eighteen months later he noticed a small tumor, the size of a lentil, in the scar on the back of the forearm. This was removed, and the wound healed in twenty days. Two years before his admission to the clinic a swelling appeared in the radio-carpal region on the anterior aspect which was supposed to be a cold abscess. At the operation it was found to be a new growth, and amputation advised. This was refused by the patient, but as the growth increased in size, and enlarged lymph nodes appeared in the axilla, he decided on operation and sought admission to my clinic.

The patient was a man in apparently robust health, presenting a hard, ulcerated swelling in the anterior aspect of the forearm, and joined to the radius. The axillary nodes were swollen and indolent.

Operation (Dec. 21, 1900) cleaning out of the axilla.

(a) I made an incision through the skin and subcutaneous tissue two finger-breadths below the crease of the elbow, the dissection of the cuff of skin was continued up to the junction of the middle and upper thirds of the arm.

(b) I carefully detached the biceps tendon from its radial attachment, and the tendon of the triceps from its attachment to the olecranon.

(c) I made a circular incision over the humerus and, after preparing the periosteum, sawed the bone through in its lower third.

(d) The constrictor was removed and hemostasis carefully carried out, the nerves were then resected. I next sutured the tendon of the biceps to that of the triceps forming a loop or ring.

(e) In the long cutaneous cuff I made two lateral incisions 1 1-5 inches from the free border. These incisions were two inches long, and opposed to each other. This skin cuff having been superposed on the tendinous ring, I sutured the edges of the incisions so as to form a button-hole in the center of the tendinous loop.

(f) Lastly, I sutured the lower edge of the skin cuff in a sagittal direction. Thus the musculo-tendinous loop was entirely covered by skin and subcutaneous tissue. The button-hole was stuffed with gauze so as to hold it open after the operation and during the subsequent dressings. The redundant skin and subcutaneous tissue in the cuff soon atrophied.

As soon as the scar became solid, traction on the loop was begun. Little by little the patient could by muscular contraction lift heavier and heavier weights, until he could raise 4.4 pounds.

On October 30, 1905, showing the patient at the Italian Surgical Congress, I said: "The condition of the patient is satisfactory and the neoplasm has not recurred." The extremity of the amputation stump is furnished with a traction ring to which may be fastened the cords of an orthopedic apparatus which has been made by a competent maker in Pisa. At the time he left the clinic the patient could easily lift 4.4 pounds with his loop. At present this is lessened somewhat, since he has used the arm but little in the past two years. However, the strength of the traction-loop is remarkable, and he could very soon regain the strength he had before.

Case 2. [In this case a single loop was formed by joining the extensor tendons to the flexor tendons. Unfortunately gangrene ensued and the slough involved all of the loop, the wound healing by second intention.]

Case 3. T. A., aged 39. Eight years before admission to the clinic the wrist had been resected for tuberculosis, healing took place with deformity (outward subluxation). For two years past there had been recurrence of the disease, and the lower part of the forearm was

involved, especially on the outer side. For this reason, and on account of the considerable deformity of the hand, the patient demanded amputation.

Operation January 24, 1906. Elastic constriction.

(a) Circular incision of the skin and subcutaneous tissue at the lower fourth of the forearm. The tendons and muscles were divided on a level with the retracted skin, by sawing through the bones the tuberculous focus was at once removed from the field of operation.

(b) Two lateral incisions each six inches long were made, one on the outer side of the radius, the other on the inner side of the ulna.

(c) Two quadrangular flaps of skin and subcutaneous tissue were dissected up as far as the upper third of the forearm, and beneath these two other flaps (musculo-tendinous) were prepared. At the base of the latter, after severing the deep muscles and making a periosteal cuff, the radius and ulna were sawn through. The radial and ulnar arteries were next ligated and the stumps interposed at the ends of the flaps. The constrictor was then removed, and after hemostasis the ends of the nerves resected.

(d) The dorsal musculo-tendinous flap was divided into two nearly equal halves (especially as regards the tendons). The ends of the tendons of one-half were sutured to those of the other half, so as to form a ring or stirrup of each musculo-tendinous flap. The same was done with the musculo-tendinous flap on the ventral side. The manner in which the two musculo-tendinous flaps was covered with skin was as follows:

In each flap two longitudinal button-hole incisions were made, 1 1-5 inches long, one proximal, the other distal. The two incisions in each flap were made at the same level, folding the skin flap on the respective musculo-tendinous flap. The button-holes left by the two incisions were sutured with silk. Then the longitudinal sides of the flaps thus folded over were sutured. The lower edges of each flap were found to lie on a level with the cut surfaces of the bones of the forearm and were sutured between them. On account of the bad results in Case 2, four drains were left in. Thus two ring-shaped motors were formed at the end of the stump wholly covered by skin.

The post-operative sequelæ were uneventful, complete cicatrization took place at the end of two months. The redundant skin and subcutaneous tissue in the loops soon atrophied. Traction was then begun on the rings which functionated like two motors under the control of the will. It sufficed to tell the patient to open his hand for him to contract the dorsal motor, and to close his hand when he contracted the ventral loop. An artificial hand is being made for him by a competent instrument maker. M. Vanghetti took a great deal of interest in this case, and by his advice the instrument maker used the ventral motor for the palmar flexion, and the dorsal motor for abduction of the thumb. The extension of the fingers will be provided for by the springs of the artificial hand.

While inspired by Vanghetti's idea, I did not follow all the details which he gives for isolating each muscle and tendon. I tried, on the contrary, to leave these organs in anatomic and physiologic conditions as near normal as possible, and in the best contact for nutrition. Hence I used the flexors and extensors as a whole when small, and isolated only such muscles and tendons as were of some size (biceps, triceps, brachialis). While this method is very useful in the arm, it will, in my opinion, find but little application in the leg. Again, as the musculo-tendinous loops must be covered with skin, and this rather firmly so they can withstand the pressure from the orthopedic apparatus, this fact will have a tendency to limit the method, not every case affords enough skin for this purpose. Especially since a considerable amount of skin is necessary.

The kineplastic amputation has no relation whatsoever to any operative method known at present; it has no analogy with tendoplasty or tendon transplantation, or with osteoplastic amputations. The method is bound to open a new route for the activity and ingenuity of the surgeon and for the great benefit of the patient.—*Presse Medicale.*

Extracts and Abstracts.

FURTHER OBSERVATIONS OF EPIPHYSEAL SEPARATION OF THE ENDS OF THE HUMERUS.

BY M. M. LUCID, M. D., CORTLAND, N. Y.

I shall discuss only the practical *anatomic* phases, the etiology, diagnosis, and treatment equitably, for the purpose of reviewing such conclusions as have seemed justifiable, with the hope that I may be able to present an outline of this subject which will prove of interest, and invite criticism.

It is, indeed, strange that so little has been written upon the subject of epiphyseal separation of the ends of the humerus; but the epiphyseal structures are small, and we are ever conscious of the fact that nowadays most surgeons are looking for larger game. The subject is still in need of further study, and the knowledge necessary to insure positive results can only be gained by the careful study of many cases.

When we appreciate the positive fact that no physician or surgeon has, after improper reduction and faulty fixation of the injury referred to, had perfect movement, we have sufficient data to justify us in concluding that in no field of bone surgery is harmonious action of the physician and surgeon more necessary for the results demanded and justly due the suffering patient.

Many are the problems that present themselves for solution in the management of cases of epiphyseal separation of the ends of the humerus, for the proper determination of which all of the surgeon's resources are requisite. Few cases in bone surgery make greater demands upon his tact, knowledge, experience, and judgment; or in which the necessity for intelligent and effective treatment is more urgent.

A brief description of the plan of development of the humerus will enable us better to understand the separation of the epiphyses, both at the upper and lower ends of the bone. The humerus is originally formed from seven cartilaginous centers—one for the shaft, one for the head, one for the tuberosity, one for each epicondyle and two for the lower articulating ends of the bone. The shaft is ossified in nearly its whole length at the time of birth. Ossification begins in the centers for the upper end of the bone between the first and fourth years, and they coalesce by the end of the fifth year so as to form a single epiphysis, which finally unites with the shaft about the twentieth year of life.

At the lower end of the bone, ossification begins in the radial portion of the articular surface at the end of the second year, and the trochlear portion at the twelfth year; in the internal epicondyle at the fifth year, and in the external epicondyle at the fourteenth year. At the sixteenth or seventeenth year of life all the centers are joined to each other and to the shaft, except the inner epicondyle, which does not unite by bone with the shaft till the eighteenth year. It will be observed, therefore, that although the ossification begins in the upper epiphysis first, it is the last to form bony union with the shaft, which process is completed about the twenty-first year of life. It is hence apparent that the superior epiphysis of the humerus comprises not only the head of the bone, but likewise both tuberosities, with that portion of the bicipital groove which is not situated between the processes. Internally, it corresponds exactly to the cartilaginous surfaces of the head of the humerus, but in front, externally, and behind its line of junction with the shaft passes below the tuberosities. The supraspinatus and infraspinatus muscles are not, therefore, attached to the lower fragment, nor is there any difficulty in comprehending osseous union, for the head of the bone forms one body with the tuberosities, and is richly supplied with blood.

Epiphyseal separation belongs almost exclusively to youth and childhood, and is occasioned either by a direct blow or fall upon the shoulder, or by a violent wrenching of the arm, as during delivery, causing separation of the superior epiphysis; while separation of the lower epiphysis is usually the result of a fall upon the elbow, excessive adduction or abduction of the forearm with superextension, or a sudden or unex-

pected push of the arm which it is unprepared to resist.

Upon dissection in these cases in the young, the head of the humerus is found broken off at the tubercles, but it remains in the glenoid cavity and does not move with the shaft. The upper end of the lower fragment projects in front, when displacement exists, and is less sharp and angular than in cases of a broken bone. Taking the head of the humerus of a subject ten years of age, parted by maceration we find the angle made by the junction of the plane projected through the anatomic neck which makes about two-fifths of the whole surface, with the plane passing below the tuberosities measures about 100 degrees.

Separation of the upper epiphysis will not necessarily open the shoulder joint, unless in cases of very great violence, as the capsule is firmly attached to the diaphysis. In the adult the epiphyseal line marks the upper limit of the surgical neck.

The muscles are apt to acquire their greatest tension at the moment of separation, and those whose actions are in direction with the shaft press upward, the head being set upon the shaft at an angle, and were it not for the muscles attached to the tuberosities, those which act in the direction of the shaft would have a tendency to roll the now movable head upon the glenoid surface; but, instead, the muscles attached to the tubercles contract and roll the head in the socket and produce dislocation backward of the facets, which position throws now the superior edge of the diaphysis forward and retains it there. When extension is made, the head works on the projecting angle of the diaphysis, and the tense deltoid, pressing the shaft backward, will restore the rotundity of the shoulder; but the cessation of the extension finds the capsular muscles ready to roll the head out and project the diaphysis forward, and the symptoms return as soon as the extension ceases.

Of the lower epiphysis very little has yet been written concerning the pathology. The synovial membrane forms at about the fifteenth year and afterward, when it overlaps the epiphyseal line. The epiphyseal line is a little higher on the outer than on the inner side. It inclines obliquely downward and inward. The epiphysis is thinner internally than externally. The humerus is separated from its cartilaginous expansion at the condyles near the elbow joint, in which case the lower fragment would comprise the entire epiphysis, which is composed of four distinct pieces, but either or both epicondyles may remain attached to the fragment.

Notwithstanding the very positive statements with reference to the *diagnosis* of epiphyseal separation of the ends of the humerus by Astley Cooper, R. W. Smith, and Frank H. Hamilton, one would scarcely suppose that great confusion had existed, and still exists, as regards the exact nature of fracture of the humerus at the point under discussion; but error of diagnosis does occur, and that constantly, as pointed out by Poland in his work upon "Separation of the Epiphyses." In my opinion this results from the fact that a clear conception of the change of position has not been put forth, and more than this, no method that secures reduction, save that of Moore's which is a most effectual one, has thus far been proposed. The constancy of the symptoms make this condition differ from most that occur in adjoining structures.

The chief diagnostic signs of separation of the upper epiphysis are: first, an abrupt projection can be seen and felt on the front of the shoulder about 1 inch beneath the coracoid, caused by the upper end of the lower fragment. Second, crepitus, when felt, is of a softer character than in fracture. Third, the end of the shaft is rounded and smooth, not sharp as in fracture, and has the form of a low cone. Fourth, the immediate recurrence of the deformity when the means employed for its reduction cease to be in operation. The most important practical point with reference to the diagnosis is that the accident is apt to be followed by arrest of development if not properly reduced. These diagnostic and unfailing manifestations deserve to be memorized, because they exemplify the great difficulty often experienced in diagnosticating exactly the true seat of the solution of continuity, as well as the necessity that these signs should be correctly interpreted. The x-ray affords, perhaps, th emost positive means for diagnosis. The simple anatomic fact

which affords valuable information with reference to the diagnosis of separation of the upper epiphysis is that the tuberosities form a part of the upper fragment.

In view of such a displacement at the upper end of the humerus, the natural mode of reduction would seem to be one that would carry the shaft backward and thus restore the corresponding facets to their normal positions. The great error that is constantly made is the severe and protracted extension made to reduce the relaxation, which traction may, in a measure, cause the disappearance of the deformity; but the moment the parts are abandoned to the uncontrollable action of the muscles the deformity recurs.

The most effectual mode of reduction is by carrying, with moderate extension, the humerus forward and upward. The head will roll upon the glenoid surface in any motion of the arm until restrained by the capsule. Now then, while the humerus is still back of the central line of the body, the head is rolled upward, and long before the humerus is brought up perpendicularly, the capsule at the lower border of the head has become tense, thus holding it firm; while the humerus, being thrown up and restrained by its muscles, slides the diaphysis backward, producing a coaptation of the corresponding facets. In other words, the reduction is effected by carrying the arm forward and upward, using moderate extension to the perpendicular line with the body.

The retention is effected by moderate extension while bringing the arm down to the side, and maintaining this slight extension until dressings for the purpose of continuing it are applied. Moore's method, which consists of a Swinburn splint fastened to the outer side of the arm, resting its lower end in a strip of adhesive plaster, while the upper end projects 2 inches above the shoulder, with a notch through which a bandage is passed under the axilla for extension, fulfills easily and promptly the indications.

With reference to the diagnosis of separation of the epiphysis at the lower end of the humerus, it is easy—on paper. But when the surgeon is called, enough time has usually elapsed to permit of swelling, and with an elbow-joint often as big as the calf of the leg, or bigger, and the bony landmarks covered deeply by congested and edematous flesh, I know of nothing more difficult, in reality, than to determine just the nature of the injury. The x-ray affords at this juncture valuable assistance.

There may be fracture alone of the humerus, ulna, or radius, or any two of these bones, or each may have therewith associated a dislocation, or a dislocation alone may be present. The dislocation is easiest of diagnosis because of abnormal rigidity, but fractures, either singly or with a dislocation, are less easily determined with exactitude. If the beginner in surgery will wrap the elbow of a skeleton in a pillow and try and examine the joint through its depths, he will approximate the difficulty of the case. Could we be sure of dislocation only, our duty is plain—namely, simply to reduce it at once, for any delay increases the difficulty and also invites a stiff joint. Again, if we felt certain of fracture alone, we should feel mentally at ease, for there need be no haste in setting a fracture if the fragments are not badly displaced, because no callus is formed for nearly a week, which time would be sufficient to allow swelling to subside, and reduction could then be exactly performed.

Unfortunately, however, the surgeon must often be in doubt, because of great swelling, as to the exact diagnosis, and a positive diagnosis obtained at the earliest possible moment has everything to do with good surgery. In this condition also the x-ray affords valuable and most reliable aid in early diagnosis. Under such circumstances the practical point I am about to mention becomes of the utmost value. Put your patient under anesthesia, this being the proper procedure in all cases of fracture, unless there is some organic lesion. Now, apply an Esmarch bandage, starting at the hand and going very slowly but firmly up the forearm, over the swollen elbow joint, and continue until the armpit is reached. Leave the bandage on say for ten or twelve minutes. At the end of that time remove it, beginning at the hand, but leaving the final few turns upon the upper end still tightly in situ. The elbow thus exposed will be pale, bloodless, and no longer

swollen. All the congestion and edema are, for the time being, caused to vanish.

The diagnosis can now be made with positive ease upon the following points: the lower end of the upper fragment will be tilted forward, will be prominent, and the elbow joint pushed seemingly backward with limited flexion, but not extension of the forearm. The lower end of the upper fragment has greater width than any fracture at the base of the condyle and the line of separation is nearer the end of the bone. There is no change in the relation of the three bony points. The existence of abnormal mobility at a very low level on the humeral shaft, muffled crepitus, is very suggestive.

An easy mode of *reduction* is to grasp the forearm and make extension with the knee in the bend of the elbow, adjusting the fragments with the free hand. Now the remaining turns of the Esmarch bandage are removed, and, of course, the swelling promptly returns; but the surgeon has accomplished his purpose. He knows the real diagnosis, applies both an anterior and posterior angular splint, with pressure anteriorly over the seat of separation, is ready to protect his own reputation, and can forecast the outcome with some degree of accuracy.

We all know that it is early errors in exact diagnosis, with resulting unfortunate lines of treatment, which most often subject the practitioner to unfavorable results. The question of passive motion in this separation is absolutely essential to get perfect extension and flexion. This should be resorted to by the surgeon—no one else—about the seventh or eighth day; then about the twelfth day, and after that every other day until the twentieth day. The fragments should be held in apposition and motion given very cautiously, thus permitting a thorough understanding as to what is taking place at the seat of the separation. If after the twenty-second day complete flexion and extension can not be produced, an anesthetic should be given and the adhesions broken up so as to allow both flexion and extension. Many times it is advisable, after provisional callus formation when the fragments are in apposition, to bandage the arm one day extended and the next day flexed. In this manner brilliant and satisfactory results may be obtained when other methods might result in ankylosis.—*Buffalo Med. Jour.*

PHYSICIAN'S LIABILITY WHERE OPERATION IS UNSUCCESSFUL.

A physician, being called in attendance upon an injured person, determined that the trouble consisted of a dislocation of the hip. He felt somewhat apprehensive, however, that there might be a fracture and accordingly placed the injured part in a plaster cast, which he claimed was a proper form of treatment in either case. The treatment was not a success and the patient brought action against the physician, claiming the latter did not use the ordinary care necessary to the making of a correct diagnosis of the injury, which, instead of being a dislocation of the hip, was, in fact, a fracture of the surgical neck of the femur. It was held that the physician had not acted in such a manner as to render himself liable for damages. A physician or surgeon is never considered as warranting a cure, unless under a special contract for that purpose. Where no express agreement is made, his implied contract is that he possesses the reasonable degree of learning, skill and experience which is ordinarily possessed by others of his profession; that he will use reasonable care and diligence in the treatment of the case, and that he will use his best judgment in all cases of doubt as to the proper course of treatment. He is not responsible for damages for want of success, unless it is shown to be the result of want of ordinary skill and learning or of reasonable care and attention. He is not presumed to engage for extraordinary skill or for extraordinary diligence, nor can he be made responsible in damages for errors in judgment or mere mistake in matters of doubt or uncertainty.—*Medical Review of Reviews.*

Peptic ulcer may follow gastroenterostomy, but is quite uncommon. The possibility of its occurrence should be borne in mind, especially in cases where hyperchlorhydria has been demonstrated before operation. In such cases alkalies should be given after operation and the diet regulated with much care.—*Schlesinger.*

Notices and Reviews.

"A Manual of Surgery" for Students and Physicians, by Francis T. Stewart, M. D., Professor of Surgery, Philadelphia Polyclinic, etc. With 504 Illustrations. Philadelphia: P. Blakiston's Son & Co., 1907. 778 pages. Flexible leather, $3.50 net.

This work is one of a series of medical manuals issued by the same publishers. Judging from the number of books of this character which are being offered, a good demand for them exists among the profession. The author has crowded a great deal of information into some thirty-one chapters, and has attempted to give the surgical treatment of a far greater number of diseases and injuries than is usually found in a work of this character. The preface states the chief desire has been to set down completely and concisely those facts which the student must know, and make such suggestions as to diagnoses and treatment as will best aid the physician in general practicee. If any criticism were offered, it would be that completeness has been frequently sacrificed for brevity.

The chapters on general diagnosis and technic are especially good and practical. Chapters VI, VII and IX on inflammation, suppuration and gangrene, rather superficially cover the subject. Chapter XV on the vascular system, is quite full and complete, as is also chapter XIX on the bones. In chapters XXII and XXXI, the author has wandered into the field of orthopedics, an excursion hardly warranted in so small a volume, the subjects not being presented with sufficient thoroughness to be of much value to the reader. The few words on amputations should either have been omitted altogether, or else been made sufficiently detailed to properly explain the procedures. Abdominal surgery treated of in chapter XXVIII is up to date, and one of the best in the book.

The illustrations are numerous, and while it is true the greater number have been drawn from earlier surgeries, there are quite a few original ones, and all serve well to explain the text. Mechanically the volume is a beautiful example of the bookmaker's art.

J. R. H.

"Modern Surgery: General and Operative." By J. Chalmers DaCosta, M. D., Professor of the Principles of Surgery and of Clinical Surgery in the Jefferson Medical College, Philadelphia. Fifth revised edition, enlarged and reset. Octavo, 1283 pages, with 872 illustrations, some in colors. Philadelphia and London: W. B. Saunders Company. Chicago: W. T. Keener & Co., 1907. Cloth, $5.50 net; Half Morocco, $7.00 net.

Da Costa's "Surgery" is so well known that it is only necessary to point out the additions and changes in this present edition.

While the whole work has been gone over, naturally those topics occupying the surgical mind at the present time have required most revision. Such, for example, as abdominal surgery and the surgery of the nervous system.

All the newer operative procedures are alluded to for instance Murphy's operation for ankylosis, Von Mosetig-Morhof's "plombierung" Matas' for aneurism; Mayo's "no-loop" method of gastrojejunostomy; and the Murphy-Fowler treatment of general peritonitis by position and proctolysis.

Altogether the author may be complimented on accomplishing in a very satisfactory manner the difficult task of compressing so many of the vast accumulation of facts relating to modern surgery into a single volume.

"International Clinics." A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Edited by W. T. Longcope, M. D. Philadelphia and London: J. B. Lippincott Company. Vol. III, 17th Series, 1907. Price, per volume, cloth, $2.00.

In the first section of the present volume A. Robin of Paris again advocates his metallic ferments in the treatment of pneumonia. There is also a very good résumé of mechanotherapy by J. W. Wainright of New York.

In the section on "Surgery" Loeb of Philadelphia, who has done good work on this subject, discusses the inoculability of tumors and the endemic occurrence of cancer. He is hopeful as to the ultimate discovery of the cause of cancer, though at present it seems almost as far off as ever. Loeb believes much has been done by the establishment of "Cancer Institutes" in this country and abroad. He does not think the alleged increase of cancer has been proved as yet, and that the general increase in the subject is due to the opening up of a new method of investigation—the experimental method. A synopsis of the work of

Hanau, Gaylord, Jensen, Ehrlich and others is given, and the article is beautifully illustrated.

J. E. Sweet of Philadelphia gives a review of "The Surgery of the Blood Vessels," in which mention is made of Murphy's gratifying results in this field.

Among other interesting contributions may be mentioned one on "The Etiology and Experimental Study of Syphilis," by F. P. Gay of Massachusetts, and a suggestive one by MM. Ancel and Bouin of Lyons and Nancy on "Spermatic and Diastematic Insufficiency."

Lastly there is a very useful one fully illustrated by R. Béal of Paris on "How to Turn Back the Upper Eyelid."

If the skin and muscles did not retract when divided, the length of a single flap necessary to cover the stump after amputation would be equal to the diameter of the limb at the level of bone section. However, skin retracts about one-third its original length when divided; therefore, it is obvious that the length of the flap, if only one is made, or the combined length of two flaps, must be at least the diameter of the limb, plus one-third, in order to amply cover the bones. For instance, if it be desired to amputate the lower third of the thigh by anterior and posterior flaps, and the diameter of the thigh at the level where it is intended to divide the bone be 6 inches, then the combined length of the flap must be at least 8 inches. This measurement can generally be made with sufficient accuracy by placing the thumb and forefinger at the extremities of the diameter of the limb, the thumb being fixed at the intended level of bone section. By rotating the thumb, the forefinger is brought into a position which marks the lower limit of a flap, equal to the diameter of the limb in length, and if this be the anterior flap the posterior will be one-third as long. Similarly, if lateral flaps are preferred, the lateral diameter can be estimated with the thumb and forefinger and the flaps fashioned accordingly (Wheeler).

Never pass an instrument if your patient is suffering from an acute inflammation of the testicle, unless you are relieving retention, or unless testitis occurs in a patient habitually using a catheter.—*Fenwick.*

Personal

Dr. B. F. Fortner, Vinita, I. T., has been appointed surgeon of the Frisco Hospital, Springfield, Mo.

Dr. Donald Macrae, local surgeon of the St. Paul at Council Bluffs, Iowa, died at his home on August 14.

Dr. Henry H. Clark, McGregor, Iowa, local surgeon for the St. Paul, has been elected medical director of the Iowa Department, G. A. R.

Dr. Solon Marks of Milwaukee, formerly chief surgeon of the St. Paul System, celebrated his eightieth birthday recently. The doctor has been obliged to relinquish practice since the fracture of his femur some three years ago.

Dr. Edward W. Lee, for many years chief surgeon of the Pennsylvania Lines west of Pittsburg, and formerly a prominent member of the old National Association of Railway Surgeons, died at his home in Chicago, on August 11, aged sixty-seven.

Dr. W. E. Ground of Superior, district surgeon of the Great Northern, was elected president of the Wisconsin State Medical Society at the recent meeting. At the same meeting Dr. H. Gasser of Platteville, local surgeon of the St. Paul, was elected second vice-president.

Dr. Henry E. Cushing of Champaign, Ill., division surgeon of the I. C., died at his home on August 11, aged fifty-two, from pleuropneumonia. The doctor contributed a paper on "Fracture of the Neck of the Femur" to the May, 1907, issue of THE RAILWAY SURGICAL JOURNAL. Dr. Jos. C. Dodds succeeds him as I. C. surgeon.

The McKinley Interurban Traction System has announced the appointment of the following surgeons: Chief Surgeon, Dr. Stephen C. Glidden, Danville; Dr. Charles F. Hough, Champaign; Dr. J. D. Knott, Monticello; Dr. George S. Edmonson, Clinton; Frank M. Ewing, Lincoln; Tyler Meriweather, Decatur; F. M. Wilbur, Riverton; G. N. Kreider, Springfield; Eliot R. Motley, Jr., Virden; James S. Collins, Carlinville; Joseph Pogue, Edwardsville; J. W. Scott, Granite City, and Carl E. Black, Jacksonville, all in Illinois.

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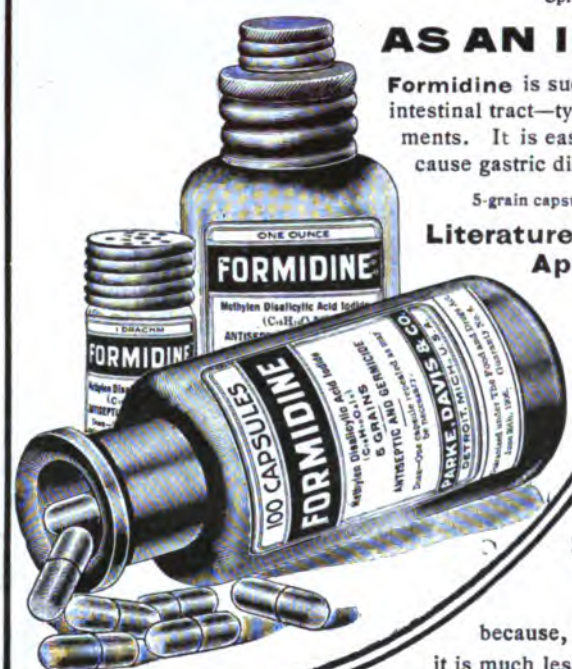

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5-grain capsules, bottles of **100.**

Literature on Application

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Cresylone is coming into extensive use for disinfection of accidental and surgical wounds, for cleansing hands and instruments after operations, for flushing internal cavities, and as a general antiseptic. It is a germicide of uncommon power and efficiency—

SUPERIOR TO CARBOLIC ACID OR CORROSIVE SUBLIMATE

because, while quite as potent as an antiseptic, it is much less toxic, being free from irritating properties and practically harmless when applied in solution of proper strength.

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EMPIRICISM.

When the powers of perception and observation first began to develop in the human animal empirical medicine began. Anyone observing animals for any length of time can see the beginnings of systems of medicine, which in the lower human beings, the savages, attain to quite an art in healing. Even today, with all our civilization and accumulation of hard, cold scientific facts, it is impossible for medical men to dispense with empirical methods of treatment. Many physicians use a particular drug for no other reason than that it gives them results. Are they to be censured because they are less scientists than artists in healing? No, indeed! especially so if we stop to consider that a test tube experiment will never reveal the exact physiologic action of many drugs.

The medical man, by the very nature of the organism he treats, is called upon to observe for himself and reason philosophically, rather than depend on isolated laboratory experiments. Remedies that were used for half a century were discarded in some instances with the first advent of science, only to be re-adopted when studied more thoroughly. Particularly is this the case with chlorin and oxygen. These elements are rapidly regaining the favor in which they were once held. Chlorin and oxygen are the active principles of oxychlorine, from which they are readily available in such form that chlorin is deprived of its acid forming tendency. A brochure treating of these all-important elements, and samples will be sent on application. Oxychlorine Chemical Company, 1326 Wabash avenue, Chicago.

A PALATABLE COD-LIVER OIL PREPARATION.

The day for nauseating combinations of drugs has passed, this state being brought about by the ability of chemists to present an efficient yet palatable product. All things being equal, that combination which is pleasing to the taste will meet with much more favor at the hands of physicians than another of equal potency but less palatable.

This rule is especially applicable in the case of preparations containing cod-liver oil, a remedial agent that will long continue to be a favorite with physicians. The many pathologic conditions that will respond only to cod liver oil, showing its great worth, have put chemists on their mettle to prepare combinations in which are incorporated all of the virtues of the oil with the disagreeable features eliminated.

Hagee's cordial of the extract of cod liver oil compound long ago won the favor of the medical profession, and deservedly so, too. This cordial possesses marked advantages as a cod liver oil product and its superiority over ordinary cod liver oil is due to its palatability. Its administration may be continued over indefinite periods of time. A stomach that would quickly revolt against the pure oil or imperfectly prepared combinations containing it, will accept Hagee's cordial without any evidence of distress.—*The Medical Era.*

The Treatment of Phthisis Night Sweats. By Dr. Wilke (*Medico,* 1906, No. 52).

The old remedies for nocturnal sweats in phthisis act only symptomatically. Since the sweats must be regarded as a biochemic reaction of the organism against the invasion of the blood stream by toxic substances, a casual remedy must be able to depoison the bacterial toxins and thus remove the entire symptom-complex—the chills in the afternoon, the evening fever and the night perspiration. A priori, such an effect is to be anticipated from collargolum, as it has been shown that it acts katalytically on bacterial products.

Five phthisis patients in the second stage, with severe cough, muco-purulent expectoration and heavy night sweats, four of whom had moderate or high fever, received a tablespoonful of a 1 per cent collargolum solution four times daily.

After the use of a half dram collargolum, fever and sweats disappeared and have not returned to this date, two months later. The importance of this result with reference to nutrition and strength is evident. When severe enteritis hinders absorption, inunction or intravenous injection of collargolum is preferable to its use by mouth. Collargolum does not act upon localized pus foci; therefore its use also has diagnostic value.

Charles Gilbert Davis, M. D., Chicago, attending surgeon, Lakeside hospital; consulting surgeon, City Emergency hospital; reports on the treatment of catarrhal cholangitis and cholelithiasis with pills similar to Bauermeister's probilin, i. e., consisting of acid sodium oleate, salicylic acid, phenolpthalein and menthol.

The use of salicylic acid in pathologic conditions of the liver he began 25 years ago and found it particularly satisfactory in combination with the other drug, as a cholagogue and an antiseptic whose effect is prolonged throughout the alimentary tract. Many cases ordinarily considered amenable only to surgical invention can be satisfactorily treated with the pills, and he believes that under their use cholangitis, with and without stones, will ultimately cease to be a surgical condition.

He relates six typical cases in which he found the combination effective, not as a purgative pill, but more especially as a cholagogue, a concretion solvent and a biliary disinfectant. The menthol and the phenolphthalein produce and regulate intestinal activity, and the salicylic acid and the oleate have a decided antiseptic and powerful cholagogue action.

He does not restrict diet too closely, but interdicts all foods known to be difficult of digestion and all alcoholic beverages. The principal point to be observed is to insist that large draughts of hot water be taken with the pills, for the purpose of diluting the excretions and assisting in breaking up any concretions present.—*Therapeutic Gazette.*

EVERY PHYSICIAN KNOWS.

Every physician knows full well the advantages to be derived from the use of antikamnia in very many diseases, but a number of them are still lacking a knowledge of the fact that antikamnia in combination with various remedies, has a peculiarly happy effect; particularly is this the case when combined with salol. Salol is a most valuable remedy in many affections; and its usefulness seems to be enhanced by combining it with antikamnia. The rheumatoid conditions so often seen in various manifestations are wonderfully relieved by the use of this combination. After fevers, inflammations, etc., there frequently remain various painful and annoying conditions which may continue, namely: the severe headaches which occur after meningitis, a "stitch in the side" following pleurisy, the precordial pain of pericarditis and the painful stiffness of the joints which remain after a rheumatic attack—all these conditions are relieved by this combination called "Antikamnia & Salol Tablets" containing 2½ grains, each of antikamnia and of salol and the dose of which is one or two every two or three hours. They are also recommended highly in the treatment of cases of both acute and chronic cystitis. The pain and burning is relieved to a marked degree. Salol neutralizes the uric acid and clears up the urine. This remedy is a reliable one in the treatment of diarrhoea, entero colitis, dysentery, etc. In dysentery, where there are bloody, slimy discharges, with tormina and tenesmus, a good dose of sulphate of magnesia, followed by two antikamnia and salol tablets every three hours will give results that are gratifying.

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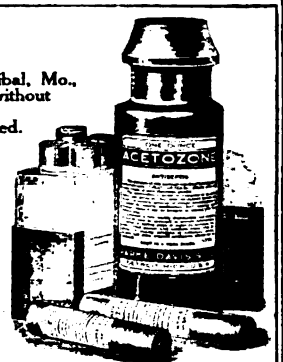
ACETOZONE in TYPHOID FEVER

NINETY-ONE CASES WITHOUT A DEATH.

In the *Journal of the Missouri State Medical Association*, May, 1907, William H. Hays, M. D., Hannibal, Mo., writes of his treatment of ninety-one cases of typhoid fever, covering a period of four years (1903-1906), without a death and with but two relapses.

"Acetozone, as an internal antiseptic," says Dr. Hays, "is superior to anything else I have ever employed. I have noticed an immediate effect upon all the symptoms shortly after the institution of its use. The odor of the stools and of the sick-room is markedly improved, so much so as to cause comment. Convalescence of the patients has been rapid. In fact, it has been difficult to convince some of them that they were ill after the second or third week. I have had no serious trouble from tympanites nor have I been much embarrassed by delirium."

[NOTE.—This report of Dr. Hays has been reprinted in pamphlet form. We shall be pleased to send a copy of it to any physician upon request.]



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Acetozone, 15 grains; warm water, 32 fluidounces.

The mixture should be shaken vigorously and allowed to stand two hours, the stock bottle to be kept in a refrigerator or other cool place and the liquid decanted off as required. For flavor, if desired, a few drops of orange or lemon juice may be added to each dose *as taken.* The solution replaces water and all other liquids, and the patient should be urged to drink *ad libitum.*

Acetozone is supplied in ounce, half-ounce and quarter-ounce bottles; also in vials of 15 grains, six vials in a box.

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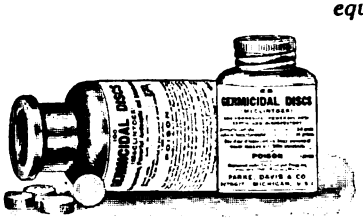

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The Railway Surgical Journal

VOL. XIV—No. 2 CHICAGO, OCTOBER, 1907 WHOLE NUMBER 257

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Cactin, A. A. Co. (from Cactus Grandiflorus),	gr. 1-67	Per 500, same, $6.50; 1000, 12.00	

Half strength the above—25, 30c; 100, $1.00; 500. $4.75; 1,000. $9.25

NOTE—Scopolamine must not be substituted on this formula, neither hyoscine from scopola. Regardless of alleged chemical identity, which we deny, physiologic results are NOT the same. Neither should you underestimate the value in this formula of "Cactin." It's the synergistic whole that produces the result. There is no "just as good."

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READ WHAT HE SAYS.

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FRANK FAUST, Pottsville, Pa.

This demonstrates that the loss of a leg does not debar a man from firing a locomotive.

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THE Railway Surgical JOURNAL

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THE TREATMENT OF FRACTURE OF THE NECK OF THE FEMUR.*

JOHN PRENTISS LORD, M. D., OMAHA, NEB.

Professor of Surgery Creighton Medical College, Attending Surgeon St. Joseph's, Wise, Clarkson and Douglas County Hospitals, Consulting Surgeon South Omaha Hospital, Orthopedic Surgeon and Superintendent Nebraska State Hospital for Ruptured, Crippled and Deformed Children.

In 1883, less than twenty-five years ago, when Professor Senn sent letters of inquiry to fifty leading surgeons of Europe and America, less than half of them believed that bony union of the fractured femoral neck was possible, and all believed fibrous union the rule. Senn's researches, experiments, practice and writing did much to establish the fact that bony union is the rule when reduction and immobilization are complete. This has been demonstrated by Maxwell, and possibly others, but mostly to Senn is the credit due for forcing this truth upon the profession, whose practice had demonstrated the non-union theory.

Operation and direct fixation have so fully demonstrated the possibility of union by bone that other means are now confidently sought to secure the same results without the attendant risks of an operation, especially in enfeebled, senile patients, or in any case in the hands of general practitioners, without hospital advantages. Surgeons themselves now seldom practice the open operation, because it is now recognized that union by bone can be secured by reduction and the maintenance of the fragments in apposition.

The Maxwell method, so ably expounded by Ruth, has undoubtedly been most successful, but the writer doubts its having been very extensively and effectively used. Only those of a decided mechanical make-up, assuming to carry out its provisions, and maintain constant efficiency in its application. All the ordinary measures for maintaining the fragments in proper apposition may be said to be very faulty. Hence ideal results are infrequent and indifference and bad results too common.

The Whitman dressing impresses the writer favorably, but lack of experience and observation, and no knowledge of the verified results promised by its author upon presentation of the subject in 1904, precludes further discussion of its merits at this time.

Plaster-of-paris has enjoyed a lasting popularity because of its ready use and efficiency when well applied. The writer having had a strong predilection for the plaster fixed dressing, and having used the Maxwell method intermittently for a quarter of a century and having secured good results from it, has sought to secure its advantages in a fixed or permanent dresisng of plaster. This is accomplished as follows: Adhesive plaster, for Buck's extension is applied to the leg and thigh, to the perineum. A rope is secured to the stirrup and passed about an assistant's body that he may readily maintain extension during the dressing.

The foot and leg are also supported by him. With the patient anesthetized, and resting upon a special device of some kind suitable for the

*Read at third annual meeting American Association of Railway Surgeons, Chicago, October 17, 18, 19, 1906.

application of the plaster. The foot, limb, pelvis and trunk to the ninth rib, are swathed in cotton and bandages; the malleoli, os calcis, head of fibula, iliac bones, and sacrum being especially guarded in the emaciated patient. Plaster is applied to the foot, leg, and thigh, to the perineum. A rope and pulley, at an angle of about 30 or 40 degrees, is attached to the strap, and strong enough traction is exerted thereby to overcome wholly the eversion of the limb. A board about 2 feet long, 4 or 5 inches wide and about 3/8 of an inch thick, with some spring, is well padded and placed behind the great trochanter. This board is secured to the thigh in this position by a bandage of plaster.

Fig. 1. Fracture of femoral neck, with shortening, and characteristic eversion deformity. Buck's extension applied.

The strap is now slipped downward to allow of the joining of the lower and upper segments of plaster, and at the same time the board, which stands off from th body four or five inches, is pressed firmly against it, and secured by several turns of plaster, while special pains are taken to fully overcome all shortening deformity by traction upon the leg by means of the Buck's extension, and of the eversion deformity by upward and outward traction by means of the block and tackle, attached about the thigh, as before described. Sufficient plaster is applied to make the dressing secure for two months. (Fig. 3.) Twelve to twenty pounds extension is maintained more or less constantly for the two or more months of treatment.

The knee is slightly flexed to avoid any danger of hyperextension, which would be both painful and inimical to subsequent function. The foot should show considerable inversion, experience having shown this necessary to wholly avoid the eversion deformity. The casts have been kept on from two to three months, in the earlier cases three months, and in the latter cases two months—the latter showing just as good results. But this should be determined by the surgeon's judgment in the individual case. Sand-bags or other supports are placed behind the trochanters to sustain a portion of the body weight, and to prevent too much pressure upon the sacrum; and thus avoid lia-

Fig. 2. Plaster applied to the foot, leg and thigh. The pelvis, also, is encased, but with an interval opposite the perineum to allow correction of eversion by means of pulley traction at angle of 30 degrees. The post-trochanteric padded splint has been incorporated in the thigh portion of plaster. The shortening is overcome by strong traction by an assistant with Buck's extension rope about his body.

bility to bed-sore. Pain is at once relieved. This dressing has been used upon the very aged and debilitated, and it is the writer's opinion that patients do better no matter how debilitated, after proper reduction and fixation. Indifferent and do-nothing treatment is the worst possible treatment. Cases in which reduction and retention are contra-indicated are believed to be very exceptional.

The number of cases in which the writer's special dressing was used was seven; females, aged 23 and 75, and males, aged 42, 56, 58, 60 and 67, respectively. The deformities were

characteristic. Results, bony union in all; slight eversion, almost inappreciable in all; shortening, one-quarter of an inch in 3, one-third of an inch in 1, one-half of an inch in 1, three-eights of an inch in 1, and no demonstrable shortening in the last male patient, at three months. This man, aged 67, had primarily three-quarters inch lengthening on the injured side, but a week's wait brought the characteristic eversion and shortening. Eversion, crepitation, pain and muscular spasm, were present, and trochanter was above Nélaton's line.

The last female, 75 years, a very frail subject, was the only one in which the fracture was reduced and the dressing applied without ether Her weak and flaccid muscles rendered conditions favorable for omitting anesthesia. Her case was one formerly considered unfavorable for a fixed dressing, and prolonged confinement demonstrated this, but this treatment was well borne, as it always is, in my experience; indeed, it solves the problem for these cases, which are no longer considered formidable by me.

Fig. 3. Dressing complete. Extension is maintained until weight is attached. Sand bags are used under trochanters to prevent pressure over sacral prominence. Spring board post-trochanteric splint secures continuous pressure and maintains apposition even though cast may loosen as usual.

The disadvantages of this dressing are the following: Several assistants are necessary, three to five; considerable experience in plaster work is desirable, and "too many irons are in the fire" to give all points attention.

The advantages of this dressing as experienced by me are, that no especial facilities, not readily obtainable in any community are required; the reduction is both primary and permanent; little subsequent attention to the dressing is required; the results have been better than by other means used by the writer, and probably as good as any; and convalescence has seemed to be shorter.

Conclusions.—The treatment of the fractures of the femoral neck by an open operation is contraindicated in too large a number to become popular. Age, prejudice, and lack of facilities preclude the majority. Any dressing which does not absolutely fix and retain the fragments, and requires more or less constant watchfulness and supervision will not meet the requirements. We should aim to meet the indication in fractures of the hip as we do in other fractures which we expect to treat successfully; that is, corect the deformity, and maintain position by an efficient dressing until the bony union is complete.

DISCUSSION ON PAPERS OF DRS. LORD AND BRENNECKE.*

J. H. Stealey, Freeport, Ill.: One point that I would like to impress upon this body of surgeons is this: In going through the country I find so many cases of fractures of the neck of the femur in old people, in regard to which the majority of physicians and sometimes surgeons say, "Well, this is an old person, and it will not do to confine him to his bed for three or six weeks," and as a result they simply temporize and the patient gets up and is a cripple for life. Some of these patients, even at 60, are considered old. This is, in my opinion, entirely useless. I have had a few of these cases, and I do not believe that all the apparatus described is necessary to secure good results. I usually use Buck's method of extension. I first get the fracture reduced, then put the leg in about the normal position as near as I can and retain it there with extension, and I believe that with any surgeon it would be the exception if he did not get a good result.

*[Dr. Brennecke's paper appeared in the September number.]

Dr. S. H. Burnside, Wichita Falls, Texas: I have never had the misfortune to meet many cases of fracture of the neck of the femur, but have had two, the results of treatment of which I believe I am willing to show to any other surgeon. One case was that of a lady of 74 who fell and fractured the neck of the femur. I treated this case with old-fashioned sand-bags (which I see some writers strongly condemn). The sand-bags, which were about 6 inches in diameter, were made of canvas, and, with the limb slightly elevated, were placed on each side and held it firmly in place. That old lady walks as well as any one, she does not even limp, and she is now nearly 80. The other case was that of a gentleman of 53 years of age who, about three years ago, fell on the ice and sustained a fracture of the neck of the femur. I treated this in the same way, with sand-bags, also padding him about the hips, and he has only ½-inch shortening.

Dr. Lord (closing): If we could hear from all these other gentlemen in regard to the results which they have seen from the use of sand-bags and other ordinary methods, we would go away with a different impression from that gained in hearing about these occasional good results, which are bound to be secured if those methods are pursued. You are all familiar with the results of that treatment. I want to emphasize this point: No matter how old or enfeebled the patient is, it is my opinion that he will do better with proper reduction and extension that he will by any makeshift treatment. He is immediately relieved of the pain and all of the attendant consequences of several weeks of agony. And this rocking-chair and sand-bag treatment, and all other methods that do not aim to scientifically treat the case, I think are leading us into deep water in our treatment of these fractures. It is my opinion that the very thorough correction of the eversion deformity is a large factor in the result. A bone that is broken off and turned at nearly right angles is in no position to get bony union. We overcome that fully, and aim to keep the fragments in apposition, which gives us these results.

A PECULIAR FRACTURE OF THE FEMUR.*

E. H. KING, M. D., MUSCATINE, IOWA.

There is scarcely any part of a bone that may not be fractured under some form of traumatism applied, but there certain points of weakness in every long bone which usually give way, and it is at those weak points that breaks most frequently occur. An exception to the general rule is shown by the following case:

A young man while coasting down one of our steep streets last winter, was thrown from his sled and came in violent contact with the curbing, striking with his right knee. The physician having him in charge diagnosed a dislocated patella, which he claimed to have reduced, and put the limb in splints.

Three months afterward he came to me and I found the following condition: The general contour of the limb was good, excepting that the transverse diameter through the knee was about ½ inch more than that of the left. There was also about 2 inches shortening of the thigh. The patella was movable, extension of the leg was normal, but extreme flexion somewhat limited. The contour and motion of the hip was normal. He was using a reinforced sole on his shoe to compensate for the shortening.

A fluoroscopic examination failed to show a fracture, but a skiagraph revealed an oblique fracture extending from the external epicondyle upwards and inwards and about 6 inches in length. This obliquity had allowed the fragments to slide together and accounts for the shortening. The bony union is good and the function of the limb, barring the shortening, is also good. The difficulty in diagnosis in such an injury will be apparent, from a study of this case.

DISCUSSION.

A member: I would like to ask if the fracture still existed when the skiagraph was made?

Dr. King: There was good bony union, but

*Read at the fourteenth annual meeting C., M. & St. P. Ry. Surgical Association, Chicago, December 13, 14, 1906.

the skiagraph revealed the line of fracture and the displacement.

The paper does not call for much discussion. The case is interesting because of its rarity, the question involved being one of diagnosis principally. We can easily see that in a case of this kind we would not, unless we used extreme violence, get crepitus, because the tissues around the lower end of the femur are rather dense and nothing but the shortening would show the condition. This young physician evidently overlooked this fact entirely; he jumped to the conclusion, because he found displacement, that it was a case of simple displacement; but if we realize how firmly the patella is bound down, we will know that we are not likely to get displacement without other injury.

CONCUSSION OF BRAIN, AND COMPOUND, COMMINUTED FRACTURE OF BOTH BONES OF THE FOREARM.*

CHARLES M'ALLISTER, M. D., SPENCER, IA.

The subject of the following report, A. L. P., dentist, was 48 at the time of the accident, January 15, 1903, weighed 185 pounds, and has always been a man of excellent habits, with an extra good physique, as the result shows. The doctor's office was in the second story of a building, with stone walk in front, and coming out from the room below the office there were stone steps on this walk. The distance from the doctor's window ledge to the walk below is 23 feet by actual measurement. In attempting one morning to back in at an open window from this ledge, the doctor missed his calculation, bumped against the window casing, with his left side, and this pushed him off to the right, and head first, so as he fell the right hand, as is now thought, struck the lower of these stone steps, thus partially breaking the force of the fall on the head, as his head struck the stone walk further on. He was found lying unconscious, face downward, on the walk just beyond the bottom stone step.

Examination showed laceration, stellated in form, of the soft parts, beginning in the upper edge, and near the middle of the right eyebrow, and extending up on the forehead to the hair. The soft tissues around the laceration were badly contused, the periosteum at the central portion of the laceration was torn, and the outer table of the right frontal sinus was broken down. The retraction of the injured tissues was such that a nickel could have been easily laid into the opening that resulted. The right radius and ulna were broken near the wrist. There were so many small fragments within the first 2 inches of the carpal articulation that the parts felt, as the surgeon who assisted at the first dressing suggested, like a handful of dice under the skin.

There was a small tear through the skin, just above the wrist, on the inside of the forearm, made undoubtedly by one of the sharp fragments. There was a large contused swelling over the right elbow, another over the right knee, and ecchymosed spots here and there at other points on the right leg, side and arm.

The doctor was unconscious for a half hour, and a little disconnected in thought for three or four days. The four days following the injury remain a blank to him, as he remembers nothing for that time. Both eyes were intolerant of light for some days. Both pupils were very small while this intolerance of light existed; later the usual conditions prevailed. When able to use the eyes, every object was double, with the right object a little higher than the left one, and this double vision continues to the present, except as corrected with glasses. The right eye used to be his best eye, now he relies, with the aid of glasses, on his left eye, with which to do his work. The sense of smell was completely lost, for some two years, but he thinks it is normal now.

The ragged laceration over the right eye was thoroughly cleansed, then closed with a few stitches, as nearly as possible, without putting too much tension on the contused tissues. A moist bichlorid dressing was applied, and continued till complete healing. The stitches were

*Read at the fourteenth annual meeting C., M. & St. P. Ry. Surgical Association, Chicago, December 13, 14, 1906.

removed on the eighth day, and in a few days more there was perfect union, without any suppuration, and with no scar, except a little puckering of the skin, in and just above the right eyebrow, and the loss of the supraciliary ridge, the result of the breaking down of the outer table of the frontal sinus. The forearm was dressed with the usual flat splints, made good width, and padded, so as to hold the fragments in place, after so to speak molding the arm into proper shape. The arm was redressed quite frequently, till the splints were discontinued, at the end of four weeks. At every dressing there was gentle but thorough massage. After removal of the splints every day massage was practiced for weeks. The doctor is something of an athlete, and was very faithful with the massage. Now all the motions of the forearm and hand are restored; flexion, extension, and rotation at the wrist and elbow are as free and perfect as before the accident. There was very little elevation of temperature. The pulse and respiration were nearly normal within a few hours after the accident.

For the central trouble as indicated by the symptoms with the optic, and olfactory nerve tracts and centers, iodids and bromids were given freely, the ocular trouble being under the care of two oculists. There was a very uncomfortable feeling in the head, for a few days, and for this, at night to induce sleep, a small powder of phenacetin was given, and occasionally one or two during the day, when the head became troublesome. For some 18 months after the accident the right side of the head, beginning with the eyebrow, and following the median line on the top of the head over to the neck had a numb feeling, and one could thrust a needle into the parts without giving rise to any feeling.

In patients with *leukemia or pseudoleukemia* only operations whose indication is vital should be undertaken. The risks are: First, post-operative hemorrhage, and secondly, delay in the healing of wounds. Extirpation of the spleen or of pseudoleukemic glands are irrational procedures and should not be practiced.—*Schlesinger.*

FRACTURE INVOLVING ELBOW-JOINT A CASE WITH A UNIQUE FINISH.*

GEO. P. HANAWALT, M. D., DES MOINES, IA.

There has been so much written and said in relation to injuries of elbow joints, that there seems to be little or nothing new on this subject; therefore, my paper will not be an attempt on that line, but a rehearsal of a few well known facts, which, owing to this joint being, at once, one of the most important and delicate, and most exposed, joint of the body, can hardly be placed before the mind of the surgeon too often.

First; this queer, hinge-like joint, with its many facings, gliding articular surfaces, and angular curves and points, seems to have more complications, and, therefore, more possibilities for a late impairment than any other joint.

Having such a delicate piece of machinery to deal with, how important to know, as nearly as possible, just what lesion there is when the proper time comes, and that is, when first called to a case where there is anything wrong at or near an elbow.

At first visit or as soon thereafter as thorough cleansing can be done—that will be when a comfortable amount of heat to surface can be obtained, and a suitable table or bed is at hand. If none of this can be found, do the best, under the circumstances, by removing clothing if necessary; that is, if it has not already been torn off in the accident, then give an anesthetic at once, unless the injury is very simple and the patient will allow all motions necessary to be made to perfectly satisfy the surgeon that the injury is a simple one, and that he has made a correct diagnosis.

If there is a shadow of doubt in the mind of the surgeon, do not omit the anesthetic; often, relatives or friends will object, and ask if the injury cannot be properly dressed without it; that is said because they are excited or superstitious, which fact should not jeopardize the patient's after condition, nor the doctor's reputation, by a possible criticism, or, worse, posi-

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*Read at the fourth annual meeting Rock Island System Surgical Association, Hot Springs, Ark., December 5, 6, 1906.

tive charge of negligence because he overlooked something that would have been found if patient had been thoroughly anesthetized and full examination made.

Especially should compound or comminuted fractures be well examined and properly cleaned out and irrigated—removing any and all loose, small fragments of bone, and any shreds of soft tissue, which, when left in wound, are only a menace, by prolonging the healing process, or causing infection. All this cannot be done without giving pain, the hot irrigations especially so grateful, subsequently, are terribly painful when first used thoroughly. Therefore, give the ether or chloroform at once, if you think it necessary for proper dressing or examination, *or give up the case.*

The locality of a fracture in this region will suggest to the surgeon the proper position in which to place it after it has been dressed. Probably the angular splint (felt or perforated zinc), either posterior or anterior, depending where the drainage will be least obstructed, in compound fractures, is as nearly the right thing as we can find. It is easy to adjust and should be well padded.

Before placing on splint, great care should be used to get fragments in as nearly normal position as possible, by satisfactory manipulation, and, in compound cases, by enlarging wounds if necessary, in order to admit clean instruments and fingers, and give ocular proof of the condition within. No matter if it does take time, the risk will not be made greater, and the satisfaction of just how it is will be a strong factor in the after management; for the doctor will positively know whether his careful investigations through the wounds and openings and counter openings, have cleared the injury of all causes of irritation and infection.

The time of removing first dressings and also of making gentle effort to move the disabled joint must be decided by the doctor who attends it—no other can safely dictate to him. Generally, five to eight days is long enough to wait. The case, individually, will show for itself,—only do not wait too long.

Now, gentlemen, for the case with unusual finish: J. C. B., locomotive fireman, aged 21, athletic, slipped and fell from top of engine tank filled with coal, while he was attempting to adjust the water pipe, and fell to the frozen ground at about 10 P. M. on a cold night. He was picked up by his fellow workers and brought to my office, pale and cold, suffering much pain and having rather free hemorrhage. Heart stimulant and anodyne given at once, and, upon examination, a serious fracture, with dislocation was found at and near left elbow. Hot bichlorid solution was used freely to cleanse skin and wound in region of injury, hot, moist borated gauze applied, and the entire arm and forearm enveloped in bi-sterilized gauze and absorbent cotton, and he was sent to Mercy Hospital, where at about 10 A. M. the next day, by the assistance of Dr. Collins, the then efficient interne, he was anesthetized and dressed as follows, feeling that, possibly the arm would be lost, but we would try our best to save it, for even a stiff elbow would be better than a stump.

The temporary dressings were removed, free incisions made above and below and both anteriorly and posteriorly to joint, finding much extravasation about joint, and for three or four inches above, where an oblique fracture began and ended in intracondyloid space. Another transverse fracture passed an inch or two above the condyles, severing the fragments made by the oblique fracture, so that when pressed, the region gave the impression of a pulpy mass with the fragments of bone grating here and there in a mass.

Several pieces of bone were removed, thorough irrigation through and through, first with 1/4,000 bichlorid solution, followed by hot boric solution, washing out with hot sterile water, placing all attached fragments in as nearly their normal position as possible, packed with iodoform gauze with ruber tube for drainage, closed the wounds partially, using catgut for sutures, placed the arm and forearm on large anterior angular splint well padded with absorbent cotton covered with sterilized gauze.

All seemed to be going well, and, on fourth day dressings were removed and the injury found in perfect condition. Drainage tube and gauze removed, wound closed loosely and the arm carefully placed on posterior angular splint with the same antiseptic dressings as before.

Slight movements were made in eight or ten

days and kept up, when in four or five weeks the union seemed perfect and he was discharged from hospital in fine shape, considering the injury, and, in my opinion, not a mean monument to clean surgery.

In about three or four months it was learned that he had fully ¾ of normal use of the joint in every movement, but that he had been kindly examined by a local doctor, whose x-ray revealed that the joint was not at all like the other one—that the young man was crippled for life, and that it was all due to improper and unprofessional treatment.

The next news from the case was in shape of a notice, served by an officer, wherein I was jointly notified that the Rock Island Company was asked to pay $15,000, and myself, the modest sum of $5,000 for my share, in the breaking up of this enterprising young man.

Gentlemen, in forty-two years of professional work I have earned some money and have saved a part thereof. All my savings I am ready to pay out for defense; for such a hold-up, not one penny.

A CASE OF GONORRHEAL ARTHRITIS NECESSITATING RESECTION OF THE KNEE JOINT.*

H. NEILL, M. D., SIBLEY, IA.

The following case in which I was associated in its treatment with Dr. F. S. Hough, on account of the severity of its course, as well as the rarity of its lesions, I have thought worthy of a report. With the limited number of authorities at my command, I have found no case on record in which such a measure as resection was imperatively demanded to save the life of the patient.

History.—Mr. F., American, aged 30; occupation, commercial traveler; family history, good, and patient has never had any serious illness. Came home on the nigth of May 31st and immediately went to bed. It was found that he had been for two weeks having a profuse gonorrheal discharge, for which he was using, among other things, silver crayons to be inserted into the urethra. During one of these insertions the pencil hurt him in the deep urethra, and some blood appeared at the meatus. Shortly after this the discharge ceased, and he experienced a chill, followed in a few hours by a painful swelling of the right knee, accompanied by a high temperature.

In this condition he was first seen, and a diagnosis of synovitis, probably of gonorrheal origin, was made. There was no abatement of the knee joint symptoms, and the temperature remained alarmingly high for about three weeks, after which he commenced to have sweats, followed by remissions of temperature in the morning, he seemed to be in a notably septic condition, and so prostrated that little hope of his life was entertained at this time. The synovial sac was so distended and the pain in the joint so excruciating that morphin was liberally used and the joint aspirated on three separate occasions within a few days. He experienced some relief from the aspirations, and his pain was mostly evident on the slightest movement of the joint. After the third aspiration, the distension of the joint was relieved to a great extent, but otherwise he remained the same, except that the fever was not quite so high nor so continuous.

About this time, there being no evidence of any tendency towards recovery, it was thought that gonorrheal anthritis was the proper diagnosis; the fluid removed from the joint was sent to Dr. H. D. Valin, the pathologist at the State Hospital, at St. Peter, Minnesota, for examination, and his report was as follows: "The material from knee effusion received yesterday was carefully examined. It is a highly albuminous fluid, purulent, but no bacteria were found in it. The composition of the pus is as follows: small lymphocytes, 10 per cent; large lymphocytes, 2 per cent; polymorphonuclear neutrophiles, 88 per cent. This practically excludes a tuberculous process. For that reason I did not inoculate a guinea pig. Evidently you have to do with a case of acute gonorrheal arthritis. It may be considered a form of pyemia, suppuration in more than one place at a time.

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It is fair to expect that the gonococcus might be found in the joint in such cases and that the common bacteria of pus might be there, hence the advisability of staining for them and for the tubercle bacillus. Again, we might expect that the urate deposits about the joints when urinary function is interfered with by disease and possibly by medication. But the pathology of acute arthritis is obscure in general and in this complication in particular."

The patient, as far as weight and general health, seemed to progressively decline and became so emaciated that he was a mere skeleton. Daily examinations of joint seemed to indicate progressive necrosis of the cartilaginous structure, and finally two months after the onset of the disease amputation or resection was strongly advised as his only hope. This was strenuously objected to by the patient, but on the 11th of August he submitted to a resection of the joint. The following conditions were found: The semilunar cartilages were represented by a black, mushy material; the other cartilaginous structures were in a more or less gangrenous condition. The cartilage on the articular surface of the internal condyle was destroyed together with some of the bone subjacent to it. The articular facet of the tibia corresponding to the condyle was obliterated, the cartilage and bone in this region being entirely gone. The articulation of the other condyle did not suffer quite so much destruction, but it was markedly diseased.

The synovial membranes, subpatellar bursa, and ligamentous structures were all converted into a pultaceous mass. Pus being found also in the tibo-fibular articulation, it was necessary to remove more of the upper end of the tibia than was previously determined on. The patient had a very stormy time following the operation, being in extreme shock for 36 hours.

He has, however, been steadily improving since, and is about the house at the present.

His vitality having been so low at the time of the operation, nature did not respond very kindly in throwing out sufficient callus and in hardening the same, so that there is at the present time a very slight degree of motion, but it is hoped that the union will further consolidate, and that in the end he will have a useful limb.

FRACTURES AND INJURIES OF LOWER THIRD OF LEG, INVOLVING THE ANKLE JOINT, AND TREATMENT.*

J. F. COLE, M. D., OELWEIN, IOWA.

While the above fractures and injuries may not be as common as some, yet I deem them of sufficient importance to ask your indulgence for a short time.

Under this head we will consider fractures of the lower third of the tibia, fibula, or both; compound as well as simple involving the ankle joint. For convenience we will divide these into four classes:

1. Fractures with little or no swelling or displacement.
2. Fractures with great swelling.
3. Fractures with displacement of fragments difficult to hold corrected.
4. Open fractures.

In the first class, we will place simple fractures of the tibia or fibula and occasionally we have a fracture of both bones with little or no displacement or swelling. In these cases, the leg should be elevated for a few minutes to lessen the swelling. After cleansing the limb and ascertaining it is properly reduced, you can at once apply a plaster cast.

In the second class are placed those fractures which are not seen by the surgeon for several hours after the injury, and in which considerable swelling has taken place. Associated with such swelling there will be more or less laceration of the soft parts and possibly extensive injury of the bone. Blebs filled with bloody serum may be present at or about the seat of fracture. These should be opened and dressed with some antiseptic powder. Great care should be exercised in their treatment. In these cases to at once apply a plaster splint is not permissible, as the swelling may become so great as to threaten the life of the limb. The skin becomes tense and shiny, the leg hard and board-like; the pain becomes intense, the toes swollen and blue, due to the hemorrhage be-

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tween the fascia and the skin which produces pressure upon the circulation. In these cases operation is necessary to relieve the pressure and hemorrhage. This is best done by making an incision along the long axis of the leg. This will be followed by a decrease of swelling of the leg as well as a cessation of pain. The ligation of blood vessels is now done if necessary and the bones sutured. If these wounds remain aseptic, they may be sutured and closed in a few days or allowed to heal openly at the pleasure of the surgeon.

This mode of treatment will usually result in saving the limb. If the circulation does not return and gangrene is imminent, immediate amputation of the limb well above the fracture is the only mode of procedure. This is highly important, as traumatic gangrene is often quickly followed by septic infection. For these reasons it is best to always use temporary dressings until the swelling subsides. The leg is best placed upon a clean pillow, with straps underneath it and drawn snugly about the leg. The edges of the pillow are drawn in against the leg to assure firmness. Narrow, folded towels are then placed between the straps and leg. The straps are now tightened, the open end of the pillow case is folded and pinned under sole of foot. Three pieces of splint wood are placed between pillow and straps, one underneath and one on each side. Thus the pillow serves as a padding for the box formed by your splint wood. An ice bag may be conveniently placed along the anterior surface between the edges of the pillow, as it relieves pain, and it is said to check hemorrhage immediately after a fracture. This dressing is allowed to remain for 6 to 12 days, at which time the swelling will be partly subsided. If at this time you have little or no swelling and the deformity is in plain sight, you can proceed with plaster splint as described later on.

In the third class, we place those fractures of the leg occurring very close to the ankle joint where the greatest difficulty is experienced in holding the fragments in their proper places. This is due to the contraction of the quadriceps extensor, which tends to pull the upper fragments forward, as well as the contraction of the gastrocnemius, which tends to pull the lower fragment backward and upward, by reason of which it is difficult to reduce the fracture or to hold it in place. In many cases we find it impossible to reduce the fracture even under an anesthetic without doing a tenotomy of the tendo Achillis. After which it may be retained by a proper splint, yet it is necessary in all these cases in addition to the splint to keep up constant and uniform extension.

In the fourth class, or open fractures, it is always best in the treatment to presume that each case is an infected one. The object to be accomplished then is to convert an open infected fracture into a closed non-infected fracture. Thus it is very essential that the first dressing should be a very clean and aseptic one. In temporary dressing, the wound should be douched with boiled water and covered with a clean absorbent cotton dressing.

In applying the permanent dressing, of open fracture of the leg, every case should be anesthetized to admit of thorough examination, diagnosis, etc. Before applying initial dressing, the parts should be thoroughly scrubbed with soap and water or equal parts of benzine and soap, the limb shaved of any hair about or near the wound, then washed with a solution of chlorinated soda 1 : 30 to remove all grease or oily dirt. If necessary, the wound should be enlarged to permit of easy access to its deeper parts. There are no doubt cases of fracture of bones of the leg, open from within outward, in which the wound is small, evidently made by the bone where it is prudent to seal the wound and regard the likelihood of infection absent. No matter how wise the surgeon's judgment, these cases may or may not do well, and for this reason in my judgment it is better and safer to enlarge all wounds of open fractures, if necessary, for thorough cleansing and drainage.

The blood clots and dirt should be washed out by a bichlorid solution 1 : 500. This should be supplemented by thorough scrubbing of the tissues of the wound by gauze swabs held by forceps or sponge holders. These should be small enough as to reach all the recessies of the wound. All loose pieces of fascia, muscle or bone should be removed except large spicula of bone, which may be removed or replaced as

deemed most wise by the surgeon, ever remembering that it is a good rule if in doubt of the viability of a fragment of bone to remove it. If necessary, sever the deep fascia and suture the fragments as approximated if practicable. The corners of the wound may now be sutured, leaving ample room for wick gauze drainage for the first few days. Counter openings may be made if not sure of aseptic conditions of wound. They can do no harm and may prove a safeguard against a latent infection. Again douche with boiled water and apply aseptic dressings and a proper splint or splints.

The indication for treatment in each of these groups is correction of deformity, immobilization of fragments and restoration of limb to the normal condition. Upon arriving at the bedside of injured, one should ascertain as near as possible the cause of the injury, the direction of the blow or missile which caused it, and general condition of patient. Then after exposing the limb, have it thoroughly washed with soap and water and rubbed with alcohol. Then proceed to ascertain as far as possible the exact condition of the fracture, swelling, deformity. After having made your diagnosis, you proceed to reduce the deformity and replace the broken fragments (this may be done with or without the patient being anesthetized, as deemed best). In reducing these fractures there are three points to keep in view—the posterior and anterior contour of the limb and the general line of the leg, which should be a straight line commencing at the inner side of great toe, middle of patella and the anterior superior spine of the ilium. Keeping this in view and having reduced your fracture, you place the limb in a fracture box, lateral splints or a posterior wire splint, as best suits your fancy, having first properly padded them and bandage with a muslin bandage, always remembering to keep the foot extended and at right angles with the leg. In this you will avoid too much pressure upon the heel. Your splint should extend from below the heel to above the knee joint. By this temporary dressing, you will retain the leg in proper position until the swelling subsides and permit an easy inspection of the parts. After from 3 to 8 days it is best to apply a plaster bandage extending from the ball of the foot to above the knee, being sure while doing this to keep the limb in proper and normal shape, which can be done by having a competent assistant.

In applying the plaster-of-paris splint after having cleansed the limb, envelop it with cotton and loosely apply a cotton bandage, apply plaster from below upward, being careful that your tension is always the same and not tight enough as to interfere with the circulation. This bandage or splint will as a rule suffice until recovery. If not, it can be cut anteriorly and be made larger or smaller as desired and held adjusted by adhesive strips. The main danger of plaster is pressure, and this can be ascertained by swelling, pain and condition of circulation of extremity. In oblique fractures, proceed the same, only you may have to keep up constant extension, which can be done with the short Desault splint or the plaster splint. Where you have a wound or external injury, you simply have an opening or window in the splint that you get at it easily to dress and cleanse the parts.

I wish here to report two cases, which are rare along these lines, which came under my observation.

Case 1. Some three years ago I was called in consultation to see a man, age 40, who had been thrown out of a wagon in a runaway and who had evidently lit upon his right foot, fracturing the fibula about four inches above the external malleolus and the lower end of the tibia had been forcibly driven through the soft parts on inner side of ankle so it projected and was exposed for at least four inches. There was considerable hemorrhage, and laceration of tissue and skin. In this case we washed the parts thoroughly with soap and water, then with a bichlorid solution of 1 : 5,000, and then under a partial anesthesia (complete anesthesia was impossible owing to condition of his heart) we used extension and rotation and succeeded after some time in returning the tibia to its proper place. We again cleansed the parts and after stopping the hemorrhage sutured the wound from both ends, leaving proper opening to pack with gauze wick drain, put the leg in a box splint, keeping the foot at right

angles to leg and in proper line. The wound was dressed daily and kept aseptic. In about a week a cast was applied leaving an opening so as to properly dress the wound. The pain was controlled best by heat and elevating the limb. The man made an uneventful recovery and is now walking without a cane; has only a partial ankylosis of the ankle and follows his usual vocation, that of a butcher.

Case No. 2. Mr. W., age 28 years, while riding on the gallop around a corner, his horse fell, catching his leg between the curb stone and the animal, causing a compound comminuted fracture of both bones, about 3 inches above the ankle joint. I was called and found him lying on the floor of a restaurant, with the upper fragment of the tibia exposed, which had passed through his drawers, two pairs of pants, stocking leg and the leg of a felt boot, and was exposed for 2 inches and all covered with dirt. We stripped the leg and foot, cleansed the same thoroughly and could see no way short of amputation and so advised, but the family and the man himself absolutely refused to submit to an operation. So we douched the wound out with bichlorid 1:5,000, shaved the leg, set about to restore the bone to proper place, and reduce the dislocation of the ankle and place the limb in as near normal condition as possible. This was hard to maintain, as all the ligaments of the ankle were lacerated and torn. We put on a temporary splint with extension for a week. We then applied a plaster splint from ball of foot to above the knee, keeping up constant extension. We left an opening over the wound so as to afford easy access for treatment. This patient's fever ranged from 100-103 for the first ten days, there was a slight suppuration, but this soon ceased and he made an excellent recovery and in 10 weeks was able to walk without a crutch. There was a slight flattening of the foot, but the ankle joint was perfect in motion. His limb is now strong and he is able to do all parts of his work on the farm.

In both these cases an operation seemed unavoidable, so it is well to use conservative rather than radical surgery in these cases.

In Pott's fracture, one should ever keep in mind the anatomic relations of the tibia and fibula and the astragalus and the os calcis, remembering the two latter are held firmly together, forming the posterior part of the foot. The astragalus rests mortise-like between the internal and external malleoli. The strength of the inferior tibio-fibular articulation depends upon the strong inferior tibio-fibular ligaments, especially the interosseous ligaments. This fracture is produced by forcible eversions or abductions of the foot upon the leg, causing rupture of the internal lateral ligaments. A fracture of the tip of the internal malleolus, separation of the lower tibio-fibular articulation and oblique fracture of the fibula from 2 to 4 inches above the external malleolus, a fracture of the outer edge of the lower end of the tibia, caused by abduction in these fractures, the ankle remains very much the same in all cases. Traumatic synovitis always exists. There is great swelling usually seen first on either side of the ankle, the joint becomes distended with serum and blood which obliterates all the hollows above the joint. The foot is everted as if pushed outward, the internal malleolus is very prominent, the foot drops backward, due to the muscles of the calf of the leg and its own weight.

In reducing this fracture, grasp the back of the foot or heel with one hand and the lower part of the leg with the other, then by traction and carrying the foot inward and forward you can ascertain abnormal lateral motions and the foot will be felt to move inward to its normal position. Then care should be taken to hold the parts in normal position, which can best be done with Dupuytren's splint, or posterior wire splint, with curved footpiece. In these cases watch the foot carefully to see that it does not slip backward.

In all cases of fracture named above, at the end of three or four weeks, when you have succeeded in getting union, the limb should be taken from the splint daily and thoroughly massaged and rubbed, especially the ankle. In young adults, there should not be much of any deformity. In adults, however, you are liable to have slight shortening, flattening of the foot or partial or complete ankylosis of the ankle.

In conclusion, let me say in fractures, cleanliness, good care of patient, proper reduction of fracture, well applied splints, later massage and

rubbing, are the cardinal virtues which are to determine one's success or failure in their treatment.

DISCUSSION ON PAPERS OF DRS. HANAWALT, NEILL AND COLE.

Dr. J. D. Seba, Bland, Mo.: I have been most favorably impressed with the reading of the papers. The claim is made that there is no cavity so sacred—the peritoneal cavity, the thoracic cavity, the joint—but that we can go into it if we are satisfied that septic fluid is in there, because nature will not absorb it. The only thing to do is to give an anesthetic, open it up, and keep it open until it is drained out. Fractures such as the essayists have so ably written about are best treated by the open method and by wiring such parts together. It has been a long time since doctors were satisfied to put a fractured limb in a splint and leave it there for three weeks without looking at it, trusting to the Lord and good luck that it was getting along all right. Conservative surgeons do not do that any more. They look after a fracture, see that it is right and keep it so, when nature will do the balance.

Dr. D. S. Fairchild, Clinton, Iowa: The papers read are all very good, and I do not think I could comment on them in any way that would add to their instructiveness.

The point that seems of the greatest importance to me is the legal point—that we are liable at almost any time to have a suit for damages for these injuries. And I have often thought how we might protect ourselves by saying to the patient and his friends: "I may not get the fragments of the bone in exact apposition and even if I do they may not remain that way, or even should they remain that way the limb may not be so useful, there may be some deformity or some stiffness; but with that understanding I will do the best I can." Suits of this kind are getting so common that it seems to me we might sometimes protect ourselves by having a written statement that we could not be responsible for the result. The best of us are liable to have bad results, due sometimes perhaps to incompetency, but oftentimes to the carelessness of people themselves.

Dr. F. H. Clark, El Reno, Okla.: Dr. Hanawalt has shown us how a valuable aid can be turned into a dreadful weapon. Sometimes in the hands of the unscrupulous the x-ray has been made to do things never thought of before. Few of us expect perfect function from a fractured elbow joint, and I doubt if there is a man here who has not had his share of trouble in these cases. Therefore the thing that was turned to the doctor's disadvantage we ought to make use of in order to obtain good results.

I might tell you of a similar case under my care. A man sustained a fracture of the lower end of the humerus; he was anesthetized and the fracture reduced. He was a man over 50 and, fearing partial or complete ankylosis of the joint, I thought it would be better to place it in such a position that he could use it rather than at a right angle. So the arm was dressed and put up, but the arm swelled very rapidly for about forty-eight hours, the pain was very severe, and at the end of about seventy-two hours I became uneasy about the joint, and as he had recovered sufficiently so I could use the x-ray at the office, I took a skiagraph of the arm and found that the head of the radius had slipped out from its proper position and that the olecranon was projecting about three-quarters of an inch or an inch out of its proper position. This, of course, gave me an opportunity to immediately anesthetize the patient, place the fragments in the proper position and put the arm at a right angle, and take my chances on ankylosis. There was almost complete ankylosis—he refused to submit to an anesthetic and freely working the joint, and he is today carrying his arm at little more than a 45° angle. The point I wish to bring out is that we should use the x-ray more than we do, although it is a trouble, a nuisance. In talking recently with one of our eminent surgeons about the use of electric appliances of various kinds, he spoke of the fact that when a man comes in to have an x-ray picture taken, frequently we get ready and press the button, tell him to come back tomorrow, and it does not work. This is unfortunate, but I believe Dr. Hanawalt's experience should teach us to use it as a means of precaution more than we do.

Dr. Hanawalt (closing): I have little to say, except this: That after removing as many pieces of bone as I did from that joint, I ex-

pected to have any result, even the loss of the arm. Had I taken the arm off, I would have had no more trouble, because at the time the man understood the serious aspect of the case, and he knew that it looked as though we would lose it. I never was more surprised to find everything in good shape. When he holds the elbows in close to the side they do not look exactly alike, anyone can see that; but he has three-quarters of normal motion, admitted by his co-accusers, and three-quarters of normal motion after such an injury is—in my opinion—a monument to clean and conservative surgery.

Dr. Cole (closing): Referring to malpractice suits, I have had a little experience along this line. At the time of the injury I took a careful history of the condition of the patient, had a competent surgeon see the case with me within twelve hours, when we had a discussion of just how the man was and how he felt and the condition of affairs, then we took an x-ray. When the pressure was brought to bear and they found out the evidence we had, the man and his attorney who stimulated and prompted the case got me out of bed at 4 o'clock the morning upon which trial was to begin at 10 o'clock, and in the settlement that followed I charged more than double what I charged in the bill. Be sure and settle with the patient within ten days from the time you take the splint off—if you wait a year, nine times out of ten he will sue you. And, too, it is well to take an x-ray. Since this incident occurred I have taken an x-ray of every fracture, and I have also been very careful about the original details of the case as they came up at the time, not trusting to memory, but keeping a record of it, and I have a third person present as a witness that the record is correct. If you do that you will get rid of a whole lot of this trouble. The most important thing is to get the money for setting a fracture early, as this will stop a great deal of trouble.

Tuberculous cholecystitis is a rare disease; it may be localized to the gall bladder, or occur in association with tuberculosis in other parts of the abdomen.—*Bland-Sutton.*

FOOD POISONING.*

I. F. CROSBY, M. D., LOCAL SURGEON, STUART, IA.

There may be "death in the pot" from many causes. Food may contain the specific causes of disease, as of tuberculosis or of trichiniasis; milk or other foods may become infected with typhoid bacilli and so convey the disease. Animals (or insects, as bees) may feed on substances which cause the flesh or products to be poisonous to man.

The grains used for food may be infected with fungi and cause epidemics of ergotism, etc. Foods of all sorts may become contaminated with the bacteria of putrefaction, the products of which may be highly poisonous.

Meat Poisoning.—Cases have usually followed the eating of sausages or pork pie, or head cheese; and also occasionally beef, veal, and mutton. Very likely the reasons why sausage poisoning is much more frequent than beef, veal, or mutton, is the following: It is only acting out human nature, that the butcher tries to sell out all his meats in place of throwing a part of them away as spoiled. When the butcher's olfactory nerves tell him some of his pork and beef is getting near the danger line, he promptly makes a large batch of sausage, mixing the two meats, seasons it highly with sage, salt, and pepper, which will hide any peculiar taste, gives this product a very prominent place on his display counter, labels it so much per pound, which appears to his innocent customers a bargain, and thus he is able to get rid of his stale meats.

Poisoning by Shell-Fish and Fish.—The symptoms of mussel poisoning follow the eating of either raw or cooked mussels. The symptoms are those of acute poisoning, with profound action on the nervous system; and without gastro-intestinal manifestations, there are numbness and coldness, no fever, dilated pupils, and rapid pulse; death occurs sometimes within two hours with symptoms of collapse.

Poisoning occasionally follows the eating of

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oysters that are stale or decomposed. The symptoms in this case are usually gastro-intestinal. There are two distinct kinds of fish-poisoning. In one, the poisoning is a physiologic product of certain glands of the fish; in the other, it is the product of bacterial growth. The salted sturgeon used in parts of Russia has sometimes proven fatal in large numbers of persons. In the middle parts of Europe, the barbel is stated to be sometimes poisonous, producing the so-called "barben cholera." In China and Japan the various species of Tetrodon are also toxic, sometimes causing death within an hour, with symptoms of intense disturbance of the nervous system.

I wish to speak more particularly about a case of ptomain poisoning from eating turkey; this case was very interesting to me, as I was the patient. Last September, during my vacation, a gentleman friend and myself were traveling westward on the main line of the Canadian Pacific Railway in the province of Alberta. At 7 P. M. Sunday evening we took supper in dining car; I ordered turkey and my friend veal. During the course of the meal we traded meats, but I ate considerably more turkey than my friend did. Usually I enjoy perfect health and have good digestion; but that evening, by 8:30, I was positive my supper was not agreeing with me. Felt very uncomfortable in stomach, not severe pain; was some sick to stomach, but did not vomit at all. Had I been in almost any other place but a sleeping car, I would certainly have drank a quart of warm water and taken an emetic. By 9 P. M. my hands and feet were cold, head ached severely, could barely feel my pulse at wrist, and felt very weak.. At 9:30 went to my berth and to bed, as we were to leave the train at Calgary at 4:00 the following morning. Did not get any sleep, had to visit the closet at midnight and 1:30 A. M., bowels moving very freely. At 4:00 A. M. walked two blocks to hotel, and took a large dose of sulphate of magnesia in hot water, from which I got returns in two hours. Took 10 grains of salol every 4 hours, stayed in bed until 9 A. M. Monday, when I walked to the banks of the Bow River and sat in the sunshine for an hour and half. By 11 A. M. felt worse, went to bed, drank a pint of hot water, and at noon took another dose of salts. During the next 8 hours was very sick, could not have walked a block possibly, had a raging headache, fever 101, and was slightly delirious. The next morning, Tuesday, was barely able to travel north 150 miles. Procured 60 grains of acetozone (P., D. & Co.), mixed half of it in a quart of water, and drank it all during Tuesday; the next day drank the other 30 grains. The acetozone did me lots of good. Within an hour and a half from the time I ate the turkey I had a very decided metallic, brassy taste in my mouth, which continued for three days. My power to digest solid food returned after the fourth day. My friend had all the symptoms that I had, only in more mild form, as he was a larger man and ate much less turkey.

Since reaching home I have investigated the process of slaughtering and preserving fowl in this country. In our town we have a poultry slaughter-house run on the same plan as hundreds of others; they work about ten pickers, who kill and pick from 85 to 100 birds apiece each day, which totals about 1,000 birds. I visited this house, saw them slaughter, and the proprietor told me all he knew about the time elapsing between the time of slaughter and the consumption of this meat. Their aim in slaughtering is not to break the skin in a single place; they hang the turkey or chicken by the feet, suspended by a stout string with a slip noose, take the back of the chicken's head in the palm of the left hand, then with a sharp, small-bladed knife they open the mouth, and penetrate the roof of the mouth, cutting the large venous channels and penetrating the brain. The moment they penetrate the brain, the feathers loosen, so they rapidly jerk the feathers off; in fact, have most of them off before the bird stops kicking. After the bird stops bleeding they close the bill accurately, so the blood seals up the mouth and nostrils. In nicer grades of birds, or those for fancy market, they also wash the feet. The viscera are all left in place. At this time of year and up to New Year's, the birds are simply chilled (not frozen), shipped to the cities, and put upon the market. If they do not sell the first week, they are put in cold storage and frozen, where they are kept from one to two

years, according to the range of price; that is, if the birds had been bought at a high price, they will be kept until that price is realized, or a profit. Earlier in the season than this, they ice the poultry as soon as picked, ship it in refrigerator cars, and put it directly in cold storage.

All poultry men claim the birds keep much better with the viscera left in. Now, this plan might be all right with the style of birds such as they raise in Arkansas, Kansas, and Texas, where there would be nothing in the gizzard unless it perchance contain a grasshopper or a Texas flea. But with our fat and full-fed birds of central Iowa, such as feed in the same yard with our full corn-fed steers and hogs, the fowls' intestines and gizzard contain plenty of easily fermenting material, capable of decomposing and poisoning the meat sufficient to kill a whole family.

I can recall many cases in the past five years, people from my own neighborhood, who had gone to the city of Des Moines, had eaten stewed chicken at some lunch-counter or restaurant there, and promptly developed a case of ptomain poisoning. Our pure food commissioners certainly have plenty to do right away along this line. Four years ago I was myself poisoned in Des Moines from eating stewed chicken. From that time until this fall I did not take chances eating any poultry where I was not positive in what year the bird actually died; but I took the Canadian turkey bait all right, and was caught the first trip.

CAUSES OF RAILWAY ACCIDENTS.

"Reference to recently published statistics from various sources show: (1) That in the five years that the railways have made reports to the Interstate Commerce Commission over 70 per cent of the serious collisions on American railroads have been due to the negligence of trainmen and enginemen; (2) that where serious collisions have occurred on lines protected by block signals, 94 per cent of these have been due to negligence of trainmen and signalmen; (3) that of all the train accidents in 1906 on the Erie Railway, 95 per cent could have been avoided had every employe concerned done his full duty."—*Railway Age.*

CYSTITIS; ITS VARIED FORMS AND TREATMENT.*

F. A. O'BRIEN, M. D., EMMETTSBURG, IOWA.
Local Surgeon Rock Island System.

We have two principal forms of cystitis—that due to internal or systemic, and the one due to external or mechanic causes.

In the first: Acute, with manifestations of diseased conditions of the system and from irritation, the effect of chemic changes due to urates, decomposition and retention. Chronic, that following—or as the result of—continued or aggravated conditions. The acute complicated with local or constitutional disease and as a sequel thereof.

Under the head of cystitis due to external or mechanical causes is that of direct irritation, injuries and wounds, and sympathetic conditions following injuries to the pelvic viscera; that due to surgical intervention and infection; acute and chronic, due to systemic or diseased conditions.

We have in this first variety many phases and symptoms due to the irritation and changes in the chemic composition of the urine. Cases of this kind are of the utmost importance to both surgeon and physician, and I will consider them in order to show my ideas relative to disease and injury. Early diagnosis and prompt treatment of such cases will save the surgeon much annoyance and worry, and increase the chance of the ultimate recovery of the patient. Many of the cases of cystitis which are acute in the beginning, but not actively so, become very complicated and chronic. All acute cases under this head show symptoms of the inflammatory process in a portion or throughout the entire mucosa and structures of the bladder. The symptoms accompanying the inflammations are variable, and much depends upon the causation of some in their relative positions and complications. First, we have hyperacidity of the products and the composition of the urine itself as one of the causes of both acute and chronic forms of cystitis.

*Read at the fourth annual meeting Rock Island System Surgical Association, Hot Springs, Ark., December 5, 6, 1906.

The majority of these cases is due to the influence of the urates and hyperacidity of the urine, as I have observed by the urinalyses. In cases of the uric acid type including other disorders of the system, we find that the influences of abnormal amounts of waste products or salts are factors in the etiology of cystitis. It will be studied: First, in the blood current, for this is where the greater primary influences are brought to bear upon the system. Second, in the vascular system, fluids of this character are distributed and deposited in the various structures of the body. Third, retention, owing to the failure of the excretory organs to perform their functions of elimination. Fourth, in the bladder, where the acids create cystitis or aggravate an already existing condition. Here let us observe the chemic composition of the urates and acids We find they are not derived from albuminous metabolism, as has been supposed and taught. Their make-up is of the purin type conveyed in the organism by cellular catabolism. The process of oxidation occurring in the body is named chemically trioxy-purin or acid decomposed in the liver, which is about 45 per cent, and in the general tissues of the body excreted as urea. These compositions are converted into oxidase by the hepatic functions of fermentation and are excreted as such. The presence of these acids in excess causes irritation and decomposition, which leads directly to cystitis.

The conclusions drawn are that metabolic disorders are frequently and mostly caused by the ingestion of purin-containing substances which can serve no purpose as foods, and produce lactic acid in excess, and which exact extra effort and service on the part of the liver to functionate properly—kidneys to excrete, and bladder to retain or expel wthout plugging, overworking, or irritating and aggravating in cases of disease, acute or chronic. The conditions governing this form of cystitis are due, therefore, to 3 principal causes: (1) Introduction of abnormal and irritating chemic substances and toxins; (2) suboxidation; (3) retention. These are well understood and have not been overlooked by the diffierent authors

Here we will mention the symptoms which are most important in cases due to internal or systemic causes. The patient has to urinate much more frequently than before; pain and soreness of the bladder upon retaining urine, even for a reasonable time; pains and dull aches, becoming sharp at times in and about the region of the lower bladder, especially marked at the time of urination. Pains radiating here and there through the bladder at the points of inflammation. There is marked inaptitude for physical exertion—a history of constipation or of obstipation, with which may be associated marked systemic derangements—hepatic torpor, sallow skin, loss of nerve power or tone, with consequent irritability, sleeplessness, capillary congestion, headache and backache, fever, etc. The urine voided is always high colored and in many cases scanty, mucus, albumen and pus being present in greater or less quantities. Hemorrhage present at times—clotted and decomposed. Urethritis may or may not be present. The examination reveals acidity, and, in cases of retention and decomposition, alkaline and ammoniacal urine.

Cystitis due to external or mechanical causes, especially to direct irritation, operative intervention, wounds, injuries, sympathetic disturbances, injuries to the pelvic viscera, septic infections, unskillful and unclean introduction of instruments; cold is also a predisposing cause. We find decomposition of the urine retained or expelled, containing blood, pus, and urinary solids, which are alkaline, due to retention. That following injury is the most important and interesting to the surgeon. In all such cases the following conditions must be studied: previous history, conditions producing shock, the injuries and complications of surgical operative procedures. Timely treatment lessens the severity of these cases. The termination will be modified by the causes giving rise to the attack and circumstances attending their development. Acute cystitis from injury confined to the mucous membrane only tends to increase in severity. Smaller portions being affected, give rise to irritable bladder for some hours following the injury, and further extensions of the inflammatory process to various portions of the bladder wall. Whether cystitis be due to conditions before at the time of the injury must, if possible, be found out and likewise treated.

If due to wounds the symptoms are active. Frequent micturition and tenesmus; pain is always severe. The urine is scanty or almost wanting. It is cloudy, mixed with mucus and later with blood and pus. Chills and fever occur, pain radiates through the bladder, into the prostatic portion, and into the penis, perineum, thighs and limbs. In chronic cases the gradual severity of the symptoms and extension of the inflammatory process becomes marked, increased milky, cloudy appearance of urine, with hematuria. The reaction is alkaline from decomposition and is thickened with mucus, etc. Fetid odor, ammonium salts in excess, resulting in uremia, and generally associated with enlarged prostate. Gonorrheal urethritis must not be overlooked as a cause of cystitis. Extension of its inflammation from the urethra to the prostate and bladder gives rise to a very acute form of this disease. Inflammation from wounds of the bladder results in a very aggravated cystitis running a very rapid and acute course.

In taking up the treatment, I will say of the cases of the first or systemic type: The patient should be put to bed at once, whether the attack be mild or severe; perfect quiet, warmth and position being important factors in the treatment. of the case. At first it will be well to give mild, yet active, laxatives or salines. My usual method in such cases is to use calomel, bismuth and soda, followed by effervescent salines, again followed by mild diluent diuretics. The citrates act well, one of which gives good results in these cases—the citrate of potassium, 15 grains in water, every 2 hours. I usually give it with elixir pepsin and bismuth, as it seems to act well in this mixture. The remedies that have always held favor with me are the infusions—among them being buchu, uva ursi and corn silk. Salol and the bicarbonate of sodium in hot water at frequent intervals seem to lessen the irritation the best in acute cases. These should be given to sterilize the urine before habitual catheterization is practiced. Pain is an active symptom and relief is best given by a combination of belladonna and morphia, as may be required. Warm rectal injections of salt solution, followed by a suppository, containing belladonna and opium, should be used and continued for some time at regular hours. Hot fomentations prove good as applications only where regularly and continuously applied. Hot baths and stupes are of the utmost value and should be persisted in. Counter-irritants do not hold a place in the treatment, in my opinion.

Where the symptoms are marked the hot fomentations and baths are preferable and should be used at frequent intervals. Where the urine is highly acid lithium compound of formaldehyd representing 24 grains dissolved in 1 fluid ounce on non-alcoholic fluid extract of corn silk and couch grass, equal parts, given in teaspoonful doses night and morning in a teacupful of hot water that has been boiled and strained, or, better still, distilled water or mineral water. This can be increased or decreased, according to judgment, or 1 or 2 teaspoonfuls four times daily, in hot sterile water. It liberates the formaldehyd slowly, destroys microörganisms and prevents decomposition of the urine. Makes urine antiseptic, is soothing to the bladder, and diuretic in action; can be continued for several days with telling results in all cases. Keeping the urine well diluted with urates and acids in solution is indicated in cystitis. Sodium salicylate given in doses of 40 to 50 grains daily, acts well in many cases of the acid diathesis. Quinin in 3 to 5 grain doses every 2½ or 3 hours reduces the fever and has a tonic effect. Used in many cases and highly active is this formula:

Lithium benzoate,	
Lithium bicarbonate,	*aa* gr. XV.
Potass. bicarbonate,	gr. XX.
Aqua acidi carbonici,	Oj.

Sig.: 2 or 3 tablespoonfuls or more several times daily, 2 pints being administered daily.

Oils and stimulating diuretics should not be given under any circumstances, and are harmful. Remedies must be altered or modified to suit the individual case. If the patient is not relieved in a few days, the bladder must be catheterized and irrigations regularly given until results are satisfactory. Catheterization must be resorted to in all cases of cystitis when the acute symptoms continue for many hours after their onset, and under the strictest antiseptic precautions. Each catheter must be sterile; they should be in readiness and one should

not be used for any length of time, thus lessening the chances of further septic infections. Vaseline should not be used as a lubricant, as it tends to remain in the urethra and bladder, its frequent use filling up the orifices, and becoming decomposed and increasing septic conditions. Catheterization should be done frequently; the urine should not be allowed to remain in the bladder for more than 4 or 6 hours. After it has been evacuated, the following solutions should be used as indicated: (1) sterile normal saline solution; (2) 5 per cent (crystals) boric acid solution; (3) liquid antiseptics containing weak formaldehyd in solution. Only small quantities should be used, and great care should be exercised not to distend the bladder. The solutions to be used weak at first and continued perisistently until results are satisfactory, urine normal, etc. The cleansing of the urethra is important in all cases. Sterile solutions or injections of fl. ext. pinus and subacetate of lead with sterile water can be used for this purpose, after which the catheter is introduced, urine drawn off, and bladder irrigated.

In chronic cystitis due to systemic causes the treatment needs be active and our chief reliance must be in local irrigations. For this purpose a saturated solution of boric acid crystals may be used, or—where septic conditions are marked—bichlorid 1 : 12,000 or 15,000, or acetate of lead 1 : 1,000. Alum, carbolic acid and other solutions are sometimes used but the last two find no place in my treatment of these cases. The remedy *par excellence,* however, is the silver products, with the nitrate as the most prominent and favorable in its results. Beginning with ½ per cent solution, and at times a 2 per cent solution will be indicated. The weaker solution must be used at first, as the pain is very much increased; never distending the bladder fully at any time of irrigation.

Treatment of Cystitis Due to External Causes.—This form must always be regarded by the surgeon as serious and dangerous, and be met with active antiseptic procedures, internal treatment, support of the patient's strength, etc. Urethral wounds complicate matters the most, and it is necessary, if they be extensive, to perform suprapubic cystotomy and maintain drainage for some time until the canal is restored and inflammation subsided. Trauma, complicating a pre-existing cystitis should be treated in every case by suprapubic cystotomy, continued drainage and the internal administration of such remedies as boric acid, urotropin, uriseptin, salol, methyl blue, etc. Urine holding septic material can be changed by the patient taking large quantities of distilled and mineral waters or infusions, etc. These will reduce the septic nature of the urine. When the urethra is permeable the catheter should be introduced and the bladder irrigated with mild non-irritating antiseptic solutions. A 5 per cent solution of boric acid, 1 : 1,000 of permanganate of potash, nitrate of silver, 1 : 2,000 alum in saturated solution all act well. Other forms of salts of silver are non-irritating, antiseptic and used to the best advantage. Argyrol, protargol, etc., can be used. Irritants should be avoided. The bladder is to be filled moderately and slowly, thereby permitting escape of the fluid.

The double catheter can be used in some cases with continuous irrigation, but is not always a successful method. The septic conditions will be revealed to us by urinalysis. Suprapubic cystotomy is the only satisfactory practice in these cases to my mind.

After this operation irrigation can be continued without any trouble. These should be given every 2 or 3 hours, and a saturated solution of boric acid should be used, unless the character of the urine indicates stronger solutions. In cases of calculus drainage should be through the urethra by means of a soft self-retaining rubber catheter, keeping the bladder completely drained and irrigated for some time. The after-treatment should be support of the patient; saline transfusion is to be relied on. Enemata of saline solution should be administered and large quantities of sterile water with bicarbonate of soda taken 4 or 5 times daily. I usually prescribe the following internally after nourishment, each ounce containing:

Fl. ext. saw palmetto,	gr. 15
Fl. ext. corn silk,	gr. 15
Sandalwood,	gr. 15.

Administered in sterile or distilled water every 3 or 4 hours. Our aim should be to dilute the urine for some time by the ingestion of large

quantities of water and fluids taken and by oft-repeated irrigations.

In cases of enlarged senile prostate the only procedure for their relief is prostatectomy.

In conclusion I will say that in all cases of cystitis urinanalyses should be made frequently to guide us in the treatment. This is too little practiced by the surgeon and overlooked, because of too much to do. Many times complications result which might have been averted if this matter of urine examination were given due attention.

Test 1.—Evaporate several drops of urine to dryness in a concave dish over an alcohol lamp, add a drop or two of nitric acid and again evaporate to dryness; a red residue remains. Now add a few crystals of the volatile salt of ammonium. The formation of murexid, which shows a beautiful color throughout (purpurate of ammonia), results, showing that the urates and their components are present.

Test 2.—Another method to approximate the acids present: Strongly acidulate some acid in a test tube with hydrochloric acid and set aside for 24 hours. On examination crystals of urates will be found on the bottom, sides and floating on the surface. By doubling the quantity and in separate test tubes treated in the same manner, an approximate comparison may be made which will be accurate enough for ordinary diagnostic purposes.

Test 3.—To determine the amount of solids, collect the urine for 24 hours; this is important to determine the mean quantity of urine for that period. The quickest way of ascertaining the solids is that recommended by Buckley and Haines: Multiply the number of ounces voided in 24 hours by the last two figures of the sp. g. and add 10 per cent of the result. The answer will be in grains and will give a very close approximate of the solids. For example: If urine to the amount of 40 oz. were passed with a sp. g. of 1020, there would be $40 \times 20 = 800 + 80 = 880$ grains of solids; one-half of this amount would fairly represent the total amount of urates and acids excreted daily. In the urine of a middle-aged man, weighing about 160 pounds, about 1.200 grains of solids should be found, and about one-half of that amount, urea and acids.

Test 4.—Urine may be alkaline when first voided, and it is important that it be ascertained whether this be fixed or volatile. This may be determined as follows: The litmus paper which has been turned blue by the urine is exposed to the air until dry. If the blue color changes it was caused by or due to fixed alkali. If not, it is a volatile salt or due to the remedial agents given.

FIRST AID INSTRUCTION TO RAILROAD EMPLOYES.

BY ALBERT E. SELLENINGS, PH. B., M.D.

Recognizing the utility of a knowledge of first aid, the question arises, as to how it is to be disseminated and properly impressed upon your employes. In different localities various plans have been in use, many have been found wanting, a few have yielded desired results. Wherever first aid has been instituted and discarded, the fault has not been with first aid per se, but with the plans and system of organization.

Many establishments have the outward sign of first aid equipment by having printed instructions placed here and there throughout the works. Others again satisfy themselves with instructions and equipment carefully locked up in the office safe. Such systems offer no adequate information and excite no individual interest.

The most satisfactory, because the most efficacious way, it would seem, is the one by which each man receives personal attention and instruction in the art. The system used by one of the great western railroads commends itself as a model and I can do no better than to give you in substance the plan followed. The division superintendent was asked to fix a date for organization and to provide a meeting place, both of which were announced by a bulletin posted in conspicuous places. The men assembled and elected their own officers. The chief surgeon of the road delivered the first lecture, which was mainly preliminary and introductory. He told of the objects of first aid, its history, its development and its benefits.

Those present were enrolled as pupils and given a first aid manual. The assistant surgeon then assumed the duties of instructor and held the examinations at the end of the course, which consisted of five lectures and demonstrations. The examinations were either oral or written, as the candidate himself elected. The reason for this is obvious. The names of the successful candidates were forwarded to the chief surgeon, who together with the general manager signed the certificate indicating proficiency in first aid to the injured.

The first difficulty experienced by the men was, that the terms used in the lectures were too technical, and the second, that an attempt was made to teach too much. Again at times, it was impossible for the men to attend regularly a sequence of the five lectures and an opportunity, therefore, was given to make up the lost one or ones in a subsequent course. All this was soon modified, the language was simplified, the men were encouraged to ask questions, which brought out practical points. The lectures were followed by practical demonstrations. These excited interest, and all desired to do a dressing or adjust a bandage or appliance. It is at once apparent that the scheme of this plan cannot be effected in all places, because all men cannot be interested to the same degree.

Where the above is not practical, there can be elaborated a plan by which certain chosen men from each department are selected and given full instructions in the principles of first aid. It can then be made known that these men of the various departments are at the beck and call of those requiring ready aid. This plan will perhaps commend itself in many establishments. Added to these, many other plans suggest themselves but it is not our purpose to consider them at this time.—*Red Cross Notes.*

DOG COLLECTORS FOR CHARITY.

Among the different funds established by the Great Western Railway Company for the benefit of their employes, the "widows' and orphans' fund" has become familiar to the traveling public through the instrumentality of the company's collecting dogs. The sum collected by the dogs amounts to between £200 and £300 per annum, and provides enough to meet the assistance given by the institution to about twenty-five widows out of about 1,500 who are dependent on the fund. Some of the dogs earn as much as £30 and £40 a year; others are not so successful. A great deal depends upon the characteristics of the animal and much upon the way in which it is trained. The most famous of the collecting dogs, was undoubtedly Tim of Paddington, which collected at that station for a number of years. He has been dead a few years now, but his preserved remains are to be seen in a glass case on the principal platform, where he continues to appeal to the public on behalf of the widows and orphans. In May, 1900, he was by special command of Queen Victoria honored by a presentation to her Majesty at Paddington Station, and in February, 1901, he was similarly honored by a presentation to King Edward VII. He has earned for the fund considerably more than £1,000.

Another collecting dog—Jim—was brought to Slough Station when a few weeks old. He was like a ball of wool and could be put into one's pocket. He was very carefully trained. The first thing taught him was to get over the steps of the footbridge, and he never afterward once crossed the rails. He commenced collecting when about four months old. After a time he was taught to bark when he received a coin, which little recognition caused a great deal of amusement to his numerous patrons. One Sunday a hospital parade was organized at Southall, and Jim was taken there to collect. When his boxes were opened they were found to contain 265 coins. Considering that he gave a bark for each one this must be regarded as a good afternoon's work. He died suddenly in his harness in 1896 and was afterward placed in a glass case on the platform. Including the contributions placed in his box since his death, his earnings amount to more than £100.—*Boston Evening Transcript.*

The most important causes of *tic douloureux* are alcoholic excess, traumatism, and dental or peridental inflammation.—*Horsley.*

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THE ANNUAL MEETING.

The fourth annual meeting of the American Association of Railway Surgeons will be held in the Palmer House, southeast corner of State and Monroe streets, Chicago, on October 16, 17 and 18, 1907.

[The room in which the meetings will be held is the Ladies' Ordinary, the same one which was used last year.]

HEADQUARTERS.

The headquarters will be in the Palmer House. This hotel is conducted on the European plan exclusively. Rates, without bath, one person in a room, $1.50 per day upward; with bath, one person in a room, $2.50 upwards.

THE PROGRAM.

The provisional program is printed elsewhere in the present issue . Even at this early date it will be seen that for interesting papers and professional prominence of the speakers, the coming meeting promises to surpass any thus far held.

PULLMAN TRANSPORTATION.

As in the past, members will save their berth checks. Additional information will be given out at the meeting.

THE PERILS OF RAILWAY SURGEONS.

Dr. J. B. Baylis, of San Bernardino, Cal., who is the examining physician for the Santa Fe, was recently visited by four brakemen and one car repairer for physical examination. During the examination the doctor stepped from the room for a minute, and on his return went to use his watch to test one of the men's hearing, but the watch was gone. The watch was a present to the doctor, and he has made every effort to find it but has failed.

COST OF STOPPING TRAINS.

The cost of stopping a train, according to the figures of an expert, varies from 45 cents, for a train of ten ordinary passenger cars, to $1.61, for an express train of heavy drawing-room cars, four times the weight of the former. These calculations were for a single set of conditions. Where there is an up grade, the expense is more than on a level, and much more than on a down-grade.

Miscellaneous

PROVISIONAL PROGRAM FOURTH ANNUAL MEETING AMERICAN ASSOCIATION OF RAILWAY SURGEONS, CHICAGO, OCTOBER 16, 17 AND 18, 1907.

SYMPOSIUM ON TRAUMA AS AN ETIOLOGIC FACTOR.

Dr. D. S. Fairchild, Clinton, Iowa: "The Relation of Trauma to Appendicitis."

The discussion will be opened by Dr. A. J. Ochsner, of Chicago.

Dr. W. A. Evans, Chicago: "The Relation of Trauma to Pulmonary Tuberculosis."

Dr. Bayard Holmes, Chicago: "The Influence of Trauma in Localizing Infection in the Natural Mucous Cavities of the Body—In the Nasal Sinuses and Bronchi, in the Gall-Bladder, in the Calices of the Kidney, in the Urinary Bladder, and in the Appendix Vermiformis."

Dr. J. N. Warren, Sioux City, Iowa: "Trauma as an Etiologic Factor in Subsequent Surgical Lesions of the Abdominal Cavity."

Dr. P. E. Sawyer, Sioux City, Iowa: "Traumatic Appendicitis."

Dr. W. H. Condit, Minneapolis, Minn.: "Pelvic Injuries."

Dr. A. H. Andrews, Chicago: "Defects of Hearing and Their Relation to Enginemen."

Dr. D. W. Miller, Gilman, Ill.: "Colles' Fracture."

Dr. J. P. Webster, Chicago: "Observations in the Treatment of Over 6,000 Injured Railway Employes and Passengers, Without a Case of Tetanus and But One of Delirium Tremens."

Dr. G. W. Thompson, Winamac, Ind.: "Tetanus."

Dr. J. E. Owens, Chicago: "Treatment of Old Dislocations of the Elbow."

Dr. A. B. Bowen, Maquoketa, Iowa: "Injuries Involving the Rectum and Bladder, With Report of a Case."

Dr. W. Woodbridge, Central City, Iowa: "Diseases to Joints Following Injuries, Especially the Knee and Hip."

Dr. J. R. Crawford, Salina, Kas.: "Delayed Union in Fractures."

Dr. Chas. E. Wright, Scales Mound, Ill.: "Antiseptics, Their Use and Abuse."

Dr. J. A. Davis, Farmer City, Ill.: "First Aid Treatment."

Dr. Asa L. Williams, Vandalia, Ill.: "Suggestion in Personal Injuries."

Dr. E. B. Gilbert, Geneseo, Ill.: "Injuries to the Knee Joint."

Dr. L. C. Henley, Chicago: "Some Surgical Dont's."

Dr. C. E. Black, Jacksonville, Ill.: "Surgical Dressings."

Dr. F. H. Blackman, Geneva, Ill.: "Dust."

Dr. S. L. Ensminger, Crawfordsville, Ind.: "Amputation at the Knee Joint."

Dr. R. W. Corwin, Pueblo, Colo.: "The Treatment of Burns."

The discussion will be opened by Dr. C. H. Mayo, of Rochester, Minn.

Dr. S. Steelsmith, Abilene, Kas.: "Peri-Urethral Abscess."

Dr. W. B. Russ, San Antonio, Texas: "The Expert Witness in Medico-Legal Cases."

Dr. J. H. Rishmiller, Minneapolis, Minn.: "Exhibition of Emergency Chest, With Remarks."

Dr. J. D. Seba, Bland, Mo.: "Enucleation of the Eyeball."

Dr. A. R. Mitchell, Lincoln, Neb.: "The Etiology of Lateral Curvature of the Spine."

Dr. L. Sexton, New Orleans, La.: "Treatment of Fracture of the Patella."

Dr. Ferd. Engelbrectson, Chicago: "Demonstration of the Use of Massage in Traumatic Cases."

Dr. O. Fordyce, Guthrie Center, Iowa: "Fractures of the Patella."

Dr. S. L. McCurdy, Pittsburg, Pa.: "The Treatment of Late Complications of Fractures."

Dr. B. C. Brett, Green Bay, Wis.: "The Influence of Careful Physical Examination of Applicants for Employment."

Dr. J. F. Pember, Janesville, Wis.: "Skin Grafting, With Report of a Case."

Dr. I. D. Steffen, Antigo, Wis.: "Dislocation of Shoulder Joint, With Report of a Case."

Dr. H. Reineking, Milwaukee, Wis.: "Injuries of the Spinal Column, With Lesions of the Cord."

Dr. Archibald G. Thomson, Philadelphia: "The Thomson Lantern for Detection of Color-Blindness, With Certain Modifications Known as Model No. 2."

Dr. A. I. Bouffleur, Chicago: "Traumatic Asphyxia."

TITLES NOT ANNOUNCED.

Papers by Drs.:
John B. Murphy, Chicago.
D. W. Beattie, Neligh, Neb.
W. E. Gamble, Chicago.
S. B. McLeod, Chicago.

AMERICAN ROADS MOST DEADLY.

Herr Guillery, an official of the Prussian railway administration, has prepared a comparative table of statistics of those killed and injured by railways in various countries. He finds the railroads in the United States are the most deadly. The United States has more mileage than all Europe, but even taking that into consideration, the United States holds pre-eminence in proportional figures.

Out of every 10,000 employes the relative figures of killed are: United States, 26.1; England, 12.3; Switzerland, 8.2; Russia, 7.8; British India, 6.7; Belgium, 4.1.

In the matter of travelers injured, France holds the lowest record in the world. The United States shows proportionately forty times as many injured as Russia; twenty-two times as many as Italy; as England, twenty; Belgium, eight; Switzerland, four; Germany, two.

MODERN SURGERY.

Our work is not merely an exalted form of human carpentry. Surgery does not consist alone of manipulative dexterity and operative skill. Judgment, based on knowledge and experience, is still the master quality in our equipment, and many side issues have to be considered and disposed of by us before our patients are completely restored to health.—*London Hospital.*

It is rare to find the whole of the *gall bladder* calcified, but in many examples the process is very extensive, and the gall bladder looks like a damaged egg shell.—*Bland-Sutton.*

Translations

CONTUSIVE PNEUMONIA.

BY V. GILLOT, M. D.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

Contusive pneumonia is a pneumonia following a trauma of the chest, which did not give rise to fracture of the ribs, deep hematoma or laceration of the soft parts. It is produced as the result of a shock, of a blow producing a simple contusion and in the region thus contused. It should, then, be distinguished from traumatic pneumonia of which it is but a variety.

The existence of this form of pneumonia has been denied for a long time. The old adage "cold is the sole cause of pneumonia" was for a long time declared irrefutable. This was combatted by Behier, Lænnec and Grisolle. Litten, in Germany, was the first to assert in 1882 that pneumonia may sometimes follow contusion of the lung. He had seen it fourteen times in 320 cases, which gives the enormous percentage of 4. This assertion has since been confirmed by Proust, Andre Petit, Genin, Pezerat, Souques, Claisse and others.

This contusive pneumonia is accompanied by somewhat distinctive symptoms. Its principal characteristic is the irregularity of its course and symptoms.

The chill is often preceded by minor premonitory signs, *e. g.*, bloody sputum, persistent pain attributed to the contusion, friction sounds or subcrepitant râles at the point of contusion.

The subsequent course is that of the ordinary pneumonia, but the symptoms are not always clear cut. The fever lasts, as a rule, from five to seven days, but may persist for fifteen days and the decline is not always by crisis. There seems to be no relation between the force of the contusion and the intensity of the pain and the violence of the dyspnea on the side struck. There is not the same dynamic condition. The more violent the blow the greater seems the prostration of the patient. There is apparently delayed shock.

The onset is especially insidious, this together with the prefebrile signs should lead us

to suspect contusion as the forerunner of the pneumonia.

The importance of this form of pneumonia becomes greater, the more we have to do with accidents to workingmen. Given a subject who has sustained a trauma to the chest, even if only of minor importance, there is always the possibility of serious sequelæ and the prognosis should be reserved.

How long after a trauma to the lung may pneumonia develop? On this point the opinions are very discordant. Claisse believes unless symptoms ensue in a day or two the case is not one of contusive pneumonia. Waiss gives five or six days as the maximum limit. Notwithstanding this, Waiss reports a case where the interval between the trauma and the premonitory chill was eight days and states this is not exceptional. He quotes two cases from Behier in which the interval between these two pathologic manifestations was eight and ten days respectively.

These cases prove we must not adhere too strictly to the length of incubation of the disease, and that we should be very careful in giving statements relative to traumata of the thorax.—*Revue Internationale de Médecine et de Chirurgie.*

FATAL SPEED.

American railways kill more people in a month than European railways do in a year; American battleships have been killing more people in gunnery practice in a week than similar European ships do in a year or more. Old country methods may be slower, but they are safer, and meantime they avoid a heavy loss of valuable lives that are being constantly sacrificed to American speed and cleverness.—*Listowel (Ont.) Banner.*

AN INDIAN RAILWAY PRESIDENT.

Gen. Pleasant Porter, principal chief of the Creek nation, has organized a railway to be known as the Indian Central Railway Co. It is to comprise some 400 miles of track in Indian Territory and Texas. Will the pale faces be barred as surgeons?

Extracts and Abstracts.

A RADIOGRAPHIC SURVEY OF 170 CASES CLINICALLY DIAGNOSED AS "COLLES' FRACTURE."

BY REGINALD MORTON, M. D., F.R.C.S. EDIN.,
Medical Officer in Charge of the Electrical Department, London Hospital.

Statistics regarding any disease or injury are always of interest and value to medical men, especially when the figures are based on the careful observation of a relatively large number of cases, and among fractures probably no single one possesses such a widespread interest among the profession as that of the lower end of the radius close to its articulation with the carpus, which is generally known ,after the surgeon who first described it, as "Colles' fracture." Until the advent of the x-ray it will be remembered that many points regarding it were the subjects of considerable controversy, such as the distance of the line of fracture from the carpal border or the character of the displacement. Before 1895 we were never taught that damage to the styloid process of the ulna was a common accompaniment of this injury; in the several books published in the pre-Roentgen ray days which I have consulted it is not even mentioned. This is not surprising when we consider the necessary imperfections of clinical examination and also the fact that the opportunity for making a dissection seldom arose. Roentgen's discovery has changed all this, and thanks to the work of Lynn Thomas and others new and valuable evidence has been forthcoming.

Considering the large amount of material available at the hospital with which I have the honor to be connected, it seemed advisable to make an attempt to obtain some more or less reliable data, and accordingly instructions were given to the receiving room officers to send all cases diagnosed as Colles' fracture to be radiographed—preferably before being put up. This was carried out as systematically as possible for about 12 months, and it was in only a comparatively few cases—those arriving between

Saturday evening and Monday morning, when the radiographic department was closed—that the radiograph was taken while the dressing was in place. Owing to the large amount of practice obtained by the receiving room officers before and during their term of office, their skill in diagnosis may be taken as at least equal to that of the profession generally, and it may also be taken that in every case the history, signs, and symptoms, so far as could be elicited, pointed to the presence of this form of fracture. The radiographic procedure presented no special features.

TABLE I.

PART 1.

Total number of cases examined, 170.

	Cases.
The radius only fractured	155
The ulna only fractured	2
Both bones fractured	7
Fracture of the trapezium	1
No fracture detected	5
Dislocation of the wrist-joint complicating fracture	3
Fracture of the styloid process of the radius	20
Fracture communicating with the wrist-joint	25
Fracture of the styloid process of the ulna	88
Separation of one or both epiphyses	11

PART 2.

The line of fracture of the radius—

Transverse	120
Oblique	13
Irregular	4
Obliquely transverse	3
Transverse, but line irregular	22

The average distance of the line of fracture from the carpal border—

Cases.		Cases.	
⅛ inch	2	¾ inch	11
¼ inch	16	1 inch	2
⅜ inch	31	1¼ inches	1
½ inch	62	1½ inches	1
⅝ inch	17		

Displacement of the lower fragment of the radius—

	Cases.
Inward	3
Outward	7
Forward	7
Backward	60
Outward and forward	2
Outward and backward	11
Inward and backward	2
Impaction without comminution	67
Comminution without impaction	12
Impaction and comminution	21

In making up Table I it should be mentioned that a separation of the epiphysis is counted as a transverse fracture and also that damage to the styloid process of the ulna is not counted as a fracture of that bone. Of the total number, 155 consisted of fractures of the radius only, but two cases occurring in which the ulna was alone fractured. In seven cases both bones were fractured, while in one other the only injury that could be detected was a fracture of the trapezium. No fracture could be detected in five cases; in one of these there was some lipping of the carpal border of the radius due to osteoarthritis. Separation of one or both epiphyses occurred in 11 of the cases and three were complicated with a dislocation of the wrist-joint. The styloid process of the radius was cracked off in 20 cases, and this injury accounts for practically all those where the line of fracture was oblique, as well as for some of those which are described as "transverse but line irregular." Further, in all of these 20 cases the line of fracture ran into the joint. The wrist-joint was involved in 25 cases. This number includes the 20 cases above referred to and also some where the line of fracture was "irregular" or where there was comminution of the lower fragment. The frequency with which the styloid process of the ulna is torn off wholly or in part is very remarkable, occurring as it does in more than half the total number of cases. If we take those cases where the radius only was fractured to constitute "Colles' fracture" this process is damaged more or less in 85 of the 155 cases, or 55 per cent. This percentage, however, will be found too low for injuries which are strictly "Colles' fractures," since among the 155 cases are included several of the styloid process of the radius and others which are not true "Colles' fractures."

Part 2 of Table I refers to the lower end of the radius. Out of the 162 cases in which this bone was broken the line of fracture was transverse or approximately at right angles to the line of the shaft in 120, or 74 per cent. In all of those where the line of fracture was oblique, the line ran across the base of the styloid process and communicated with the joint. In those described as "irregular" there was considerable smashing of the end of the bone with no definite line in any particular direction. In two of those described as "obliquely transverse" the line of fracture lay across the bone obliquely without involving the joint. Among those where the fracture was "transverse but line irregular" were several in which the line was more or less curved with the convexity of the curve

looking downward. The average distance of the line of fracture from the carpal border was measured in all cases—those where the line was oblique and leading into the joint not being included in the table of measurements. The rapid rise in numbers from two at one-eighth of an inch to 62 at half an inch is very interesting, as is also the more rapid fall after this point is passed. It will be seen that in no less than 111 out of a total of 155 cases the line of fracture is half an inch or less from the carpal border, just over 71 per cent, while in 31 only is the distance over half an inch—20 per cent.

In Erichsen's "Surgery," tenth edition, 1895, p. 598, it is said: "Gordon, who gave great attention to the mechanism of this fracture, states that in 27 old specimens examined by him the line of fracture posteriorly varied from ⅜ inch to 1¾ inch, and anteriorly from ⅜ inch to 2 inches above the carpal border of the radius, being in ten 1 inch and under, in ten more than 1 inch, and in the others indefinable." It is interesting to compare these statements with the present series of fractures near the wrist where, out of a total of 155, in only two is the line of fracture over one inch above the carpal border.

The state of the lower fragment was a fertile source of discussion in the pre-Roentgen days. In the present series it will be seen that as regards displacement this takes place in a backward direction more than twice as often as all the other displacements taken together. In a large number of the cases there was no material displacement shown in the radiograph and in many of these there was impaction of the upper into the lower fragment. Impaction was present in 88 cases—nearly 57 per cent—21 of these being accompanied with comminution—comminution without impaction occurring in 12. Displacement upward has not been recorded in this series. A certain amount always takes place when the lower fragment is displaced and tilted backward, and also there is, of course, some shortening with impaction of the upper into the lower fragment. In none of the cases was there displacement upward, such as occurs in a case of fracture of the middle of the shaft of the femur.

It will be remembered that in all the 170 cases such history and signs as could be elicited gave reasonable supposition of the existence of "Colles' fracture," and Table I is valuable in showing what conditions may simulate this injury at times. Several of the cases are, of course, not "Colles' fractures," and in Table II

TABLE II.

An Analysis of Radiographic Negatives Prepared from 150 Cases of Colles' Fracture.

The line of fracture—	Cases.
Transverse	110
Oblique	12
Irregular	3
Obliquely transverse	3
Transverse, but line irregular	21

The distance from the carpal border—

Cases.		Cases.	
⅛ inch	2	¾ inch	11
¼ inch	14	1 inch	2
⅜ inch	29	1¼ inches	1
½ inch	61	1½ inches	1
⅝ inch	16		

Displacement of the lower fragment—	Cases.
Outward	6
Inward	3
Forward	7
Backward	52
Outward and forward	2
Outward and forward	2
Inward and backward	2
Impaction without comminution	66
Comminution without impaction	10
Comminution and impaction	21
Dislocation of the wrist compounding fracture	2
Fracture of the styloid process of the radius	19
Fracture communicating with the wrist-joint	24
Fracture of the styloid process of the ulna	81

an attempt has been made to prepare an analysis based only on such of the cases as conform to this injury. For this purpose only those where there was fracture of the lower end of the radius alone were taken, ignoring among others fracture of both bones and also separation of one or both epiphyses which leaves a total of 150 cases. This includes 11 cases where the line of fracture ran across the base of the styloid process of the radius communicating with the joint and having no displacement worth noting, certainly none that could have been detected clinically. This number can be deducted from the total and also from the figures relating to the styloid process of the radius and those of the fractures communicating with the wrist joint if it is felt that they should not be included when calculating percentages, but it must be remembered that they were "Colles' fractures" from the clinical point of view.—*Lancet.*

FRACTURES OF THE CRANIAL VAULT.

D. C. STRONG, M. D., SAN BERNARDINO, CAL.

The surgery of the head, while it has advanced greatly within the past fifteen years, has not nearly kept pace with abdominal and pelvic surgery. This is especially true of emergency surgery of the head.

Within the past five years it has been my privilege to see a considerable number of cases of head injury of varying degrees of severity. Many of these cases of head injury we too frequently neglect First by not thoroughly examining them, and second in delaying surgical intervention too long while waiting for focal symptoms to develop. In spite of treatment a certain number of these cases will die, but I feel that too large a per cent that might be saved by timely operation are let die simply for want of a proper examination and timely operation. These are strong statements, but autopsies following cases of skull injury will prove their truth. To determine whether an operation is necessary, and to determine the best time for operation, are questions of sufficient magnitude as to require the most careful consideration of the individual cases as they present themselves. There is sacrcely any other class of cases in which the life of the patient is as absolutely dependent upon the surgeon's decision in the case. They, themselves, are frequently unable to throw the slightest information on their case. They are frequently brought to us profoundly unconscious, with no history of accident or of their previous condition, and with little or no visible evidence of violence, and it remains for us to make, not only a probable diagnosis of injury, but for us to exclude a number of other conditions which may simulate head injury or which may be a complication of the injury.

The most frequent of these conditions are diabetic or uremic coma, opium poisoning, alcoholic coma and apoplexy; simply because we detect alcohol on an unconscious man's breath is in no wise conclusive that the man is drunk.

These cases that come to us in an unconscious condition should be very carefully examined, urine analysis should be made, stomach contents should be analyzed, their history should be carefully inquired into if it be possible. If no cause for the unconsciousness is found from this examination the head should be shaved in order to allow for a more thorough examination of the skull for fractures.

In a case of a known history or visible evidence of head injury of sufficient magnitude to warrant a suspicion of skull fracture, the head should be shaved entirely and scrubbed with soap and water and bichlorid and thoroughly examined. If there is a laceration of the scalp it should be cleansed very thoroughly and the bottom of the laceration explored for a fissured fracture even though it be necessary to enlarge the scalp wound. It has been clearly demonstrated that if the scalp is thoroughly shaved, it is no harder to render aseptic than any other skin surface, and since modern methods of disinfection have been perfected it has been shown that a compound fracture of the skull is of little or no more consequence than a simple fracture, there can be no serious objection to making an opening in the scalp that will permit of thorough examination. If a fissured fracture be found running horizontal to the meningeal vessels, there is a strong probability that the vessels have suffered rupture and such a patient should be watched very closely. If the case presents a suspicion of fracture, even though there be no laceration of the scalp, it will do no harm to inspect the suspected area by incising it to the bone.

We should examine the condition of the patient's arteries; if sclerotic, there is much more apt to be a rupture of the meningeal vessel. We should also, if possible, learn of patient's previous condition of health, whether he suffeerd from nephritis or syphilis, if so, his arteries within the dura are more apt to suffer rupture. We should inquire also if patient were active or passive at time of injury; if active and arterial pressure were raised, rupture of the vessels is more apt to have occurred.

In fractures of the skull the question that concerns us most is not the fracture but the injury to the brain, its membranes and vessels. The injury to the brain may be due to pressure caused directly by depressed fragments

of bone or from hemorrhage from the meningeal vessels or contusion of the brain itself. If the fracture be depressed there is a stronger probability of severe injury to the brain or its membranes, but a non-depressed fracture may produce an extensive laceration of the meningeal vessels.

When the symptoms are clear-cut and a clearly defined brain lesion, or in other words, well defined focal symptoms are present in a case of head injury, we do not hesitate to trephine and relieve the pressure, but if the least doubt exists we are too prone to delay, awaiting development of focal symptoms which may never appear.

If we were given a patient suffering from an equally grave abdominal condition, even though the symptoms were obscure and not very definite of anything but impending dissolution, we would advise exploratory laparotomy, and rightly so, but in these cases of skull injury we frequently do not advise exploratory trephining. I think it is clearly shown that the cranial cavity may be invaded with just as much impunity as the abdominal cavity, if not more so, and we have just as many chances, or more, of doing good by an exploratory trephining in these cases than we have in an exploratory laparotomy. Here we are dealing with an acute condition and in the abdomen we are often dealing with a chronic condition, and often one for which there is no remedy, whereas in these cases all that is necessary is to tie off a ruptured artery and sponge out a blood clot.

If we find a linear fracture with no depression and no symptom of compression, it may not require any attention other than cleansing and dressing. I have found linear fractures in which there were no suspicion of internal injury but which themselves demanded treatment, on account of the foreign particles they contained; hair, particles of a hat, etc. At the moment of the receipt of the injury if it be sufficient to produce a fracture, the skull springs open and as it rebounds it pinches within its border anything that may get within its grasp, and if this be left, infection is apt to occur even though the soft parts be thoroughly cleansed. In these a linear groove should be chiseled along the line of fracture, entirely removing this matter. I believe this mechanism of fracture explains some cases of traumatic epilepsy, and even some cases of so-called idiopathic epilepsy. The skull as it rebounds is just as apt to pinch a portion of the dura between its edges and thus set up sufficient irritation to produce epilepsy. In those cases of known injury to the skull they would be called traumatic epilepsy, but there are many cases of severe injury which are not recognized as producing fracture, or the injury may be entirely forgotten.

I believe all depressed fractures should be elevated, for we have no way of telling how much deeper the inner table may be depressed than the outer table. Some depressions will cause no trouble whatever but we have no way of telling which will and which will not, therefore I believe that true conservatism lies in doing that which we know and not that which we suspect will do no injury to the patient. True science knows and does not presume on uncertain premises.

Fractures that are of no consequence of themselves may be means of carrying infection to the meninges. In addition to shaving the head and scrubbing it with soap and water and antiseptic, we may lessen the liability to infection through fracture of the vault which extends toward the base by cleansing the ears, the nasal, oral and pharyngeal cavities and irrigating them with some antiseptic solution.

A patient receives an injury to the skull producing possibly unconsciousness, possibly not, but headache, dizziness, nausea and vomiting occur in a short time; later he again becomes unconscious, his pulse becomes slow, power is lost in the face, arm, or leg: these symptoms indicate a compression of the brain around the fissure of Rolando upon the opposite side. These are the indications that a majority of the text books would have us await for. They are the symptoms of a localized compression and death may intervene before this symptom appears. Therefore, we find it necessary to resort to operation for a less clearly defined condition than those just described.

Compression usually develops slowly and a great deal of compression may develop before manifestations become pronounced. Extensive compression does not always produce local symp-

toms; if it does, it simultaneously produces other symptoms which are not not local and consequently cloud the picture. In a case with a history of injury to the head, and in which the patient is unconscious, if there is a slow pulse which later becomes rapid with a marked increase in the respiration which has a tendency to assume the stertorous or Cheyne-Stokes type, we have two symptoms which we cannot afford to ignore. The length of the interval between first and second periods of unconsciousness is of importance when it can be learned. Frequently both sides of the body will be equally involved, yet if we observe closely we will note that the side opposite the lesion shows first sign of irritation.

When the pulse begins to become very rapid, the compression is great, because we do not get this racing pulse until there is paralysis of the vagus. The following cases illustrate the usual variety of symptoms exhibited in these cases with the exception of the last one, which case I am reporting for the rarity of such extensive injury with recovery.

Case I.—January 11th, 1906, 8:30 p. m., J. D., a miner, aged 37 was admitted to the hospital. He was profoundly unconscious. No history was obtainable at this time. It was not known in what manner the injury had been received. Later it was learned that he had been walking along the railroad track and that he was approached by a man from behind and felled to the ground by repeated blows on the head, at about 11 o'clock in the morning of the day in which he was admitted. While the head was being cleaned, he vomited several times. The pulse was rapid and irregular, breathing stertorous. He was moaning and tossing about. The left arm was atrophied from some disease or injury in childhood. There were several gashes and bruises about the head and face. One long gash extended from the anterior margin of the squamous portion of the right temporal nearly to the occipital protuberance. The head was shaved and scrubbed with soft soap and water and cleansed with ether and alcohol and disinfected with a strong solution of bichlorid, the wounds thoroughly cleansed and freely incised and a thorough examination made. The wound on the right side of the head was laid open in its entirety. A transverse fracture was found. Operation was resorted to at once. A trephine opening was made over the region of the middle meningeal and enlarged by means of De Vilbiss forceps. An extensive clot was removed and a rupture of the middle portion of the middle meningeal was found and ligated. A wick of gauze was carried to the bottom of the wound and packed in very lightly. The wound was closed immediately and a mild bichlorid dressing applied. The patient was put to bed. The following morning he was able to give a clear account of himself and to identify his assailant. His recovery was complete and rapid. He was discharged February 24th.

Case II.—J. B., age 46. Admitted January 13. While in a state of intoxication fell and struck his head on stone curbing. He was picked up unconscious. In a few minutes he became semi-conscious, but lapsed into complete unconsciousness in a little while. In this condition he was brought to the hospital, arriving there about an hour after the accident. On examination a laceration of the scalp about 2 inches long was found extending from the temporal back over the occipital region. Pulse slow, respiration labored and irregular, pupils normal. There were muscular tremors involving the right upper extremity.

The head was scrubbed and prepared; beginning just in front of the ear an incision was carried upward, thus making a horseshoe-shaped flap which was turned down exposing a small fissured fracture. A trephine opening was made over the middle meningeal, this was enlarged by means of a De Vilbiss forceps. A blood clot of quite considerable size was turned out and a rupture of the posterior branch of the middle meningeal was found. This was ligated with catgut. Narrow gauze strips were carried lightly down toward the base of the skull and brought out at the lower border of the wound. The wound was closed and dressed. The following morning the patient was able to converse readily and made an uneventful recovery.

Case III.—J. G. Admitted March 16, 10 p. m. Was struck on the head with some metal weapon by a hold-up man and felled to the

pavement. A gash was cut over the right frontal eminence. He reached the hospital about an hour after the injury. On admission he was unconscious, somewhat restless, pulse regular but rapid, respiration slightly more rapid than normal, and shallow. There was no paralysis. The head was cleansed and shaved and the wound cleaned and incised freely as to permit of a thorough examination. A small linear fracture about 2 inches long was discovered. Between the edges of this fracture were a few hairs and a silk thread or two from the lining of the cap the young man had worn at the time of the injury. As the fracture was not transverse to any of the larger meningeal vessels the probability of a rupture of the meningeal vessels was considered light. I did not feel justified in trephining such a case as this. But the wound in the skull did require attention in order to remove the infectious material from its borders. Therefore a groove was chiseled along the entire length of this fracture extending through outer table. The wound was closed and a small drainage brought out of the upper angle of the wound. Patient made a rapid recovery, was discharged March 27.

Case IV.—C. B., age 60, laborer. Admitted at noon, May 10. The morning before his admission he had fallen from the seat of a wagon, falling on his head and shoulder on a pile of boulders. He was found some hours after the accident in a semi-conscious state. This condition cleared up somewhat; on admission to the hospital, he was conscious and able to give a fairly accurate account of the accident, although his speech was not quite clear. He spoke in a hesitating manner, complained severely of pain in his head and chest. There were contusions on the scalp but no cuts or lacerations. The head was nearly bald. The pulse was slow. There were some slight twitchings of the muscles of the right arm. There was a strong suspicion of rupture of the left middle meningeal with compression along the fissure of Rolando. The nurses were required to watch the patient closely. About four hours later the pulse had become rapid—about 90—and missing beats at irregular intervals. And a partial paralysis of the right arm was noticed. Unconsciousness was not absolute but nearly so. It was decided to operate at once. He was anesthetized and a large horseshoe-shaped incision was made over the suspected area. A very extensive fracture was discovered and a trephine opening made over the middle meningeal. A large clot was discovered and in order to remove it, it was necessary to enlarge the trephine opening quite extensively. The greater portion of the clot extended posteriorly. This was removed and the hemorrhage found to be occurring from both anterior and posterior branches of the middle meningeal. These were ligated and the wound lightly packed with narrow gauze strips. The patient improved for three days, when he very suddenly died. Autopsy showed the conditions at the site of the meningeal lacerations to be perfect. On opening the thorax it was discovered there had been a fracture of the first rib which had penetrated the apex of the lung. There was a hemorrhagic area as large as the palm of the hand in the apex. The patient had complained all of the time of pain in the right chest. But I had been unable to make a diagnosis of fracture of the rib. Death was due to pulmonary embolism.

Case V.—A. C., age 27. Was beating his way on the railway. Was riding on the blind baggage, and fearing detection and arrest when the train should come to its next stopping place, and seeing the signal lamps of a small station through which they were passing and thinking that they were coming into the yards of the station at which they would stop, he jumped while they were going at a very high rate of speed. He was brought to the hospital about fourteen hours after the accident. He was unconscious, pulse was slow, respiration was irregular. He vomited shortly after admission. On examination scalp wound was found over the right eye, over the temporal and also over right parietal. The head was prepared in the usual manner. These wounds were incised freely and thoroughly examined but no fractures were discovered. The wounds were then closed. The picture of compression being so pronounced, a large horseshoe-shaped incision was made on the left side exposing the temporal and a considerable portion of the parietal. This was done on the suspicion of fracture by

contrecoup. An ugly triangular fracture was discovered opposite the parietal wound on the other side. There was no depression and no external evidence of fracture. A trephine opening was made at the lower anterior angle of this fracture. A large blood clot was discovered and sponged out through the enlarged trephine opening. A rupture of the posterior division of the meningeal artery was discovered. This was ligated with catgut, and a gauze drain lightly packed in the wound. The patient made a very slow recovery, not coming to a full realization of his surroundings for several weeks. The concussion had been a very violent one owing to the terrific force with which his head came in contact with the railroad embankment. At the time of his discharge on September 5, 1906, he had not fully recovered his mental faculties, but was daily improving.

Case VI. J. G., age 19. Admitted August 30, 1906. This was the most extensive skull injury which I have ever seen to be followed by recovery. The young man had just arrived in Los Angeles, and was accosted by two thugs, who fell upon him and robbed him and beat him with the butt end of a 44 Colt's revolver. He was found and brought to the hospital about four hours after the injuries were received. The head and face were beaten almost out of all resemblance to a human head. Yet he was not wholly unconscious, was able to answer "yes" and "no" to questions, although his speech was badly impaired and he was slow to answer questions. On examination there was found to be a fracture of the left malar bone, completely breaking down the anterior wall of the antrum of Highmore. Also a fracture of the left inferior maxilla and of right superior maxilla. The head was shaved and cleansed as well as possible. On the right side over the middle meningeal there was a depressed fracture the size of the butt of the revolver. Also another one of the same kind directly opposite this on the left side. There was also on the right side over posterior branch of middle meningeal a depressed fracture of the same size. Over the left eye there was another depressed fracture of larger dimensions, the supraorbital plate was completely destroyed. Cerebro-spinal fluid was escaping from both temporal wounds. The heart was weak and irregular, and the patient was cold and clammy. Hot water bottles were placed around patient while he was being dressed. His condition appeared so hopeless that he was dressed as hurriedly as possible and placed in bed with numerous hot water bottles, as his death was expected. The nurses were instructed to give no stimulants but simply to try to make the patient as comfortable as possible by giving sedatives if necessary.

By the following morning his condition had improved and continued to improve throughout the day. The next morning his condition was good enough to warrant an operation. The depressed fragments were elevated, the shattered supraorbital plate and a portion of the malar bone were removed, the ruptures in the dura sutured and the wounds all irrigated freely with hot alphozone solution. While there were four extensively depressed fractures of the vault, there had been no rupture of the cerebral vessels and no compression other than that occasioned by the depressed fragments themselves. These wounds were packed lightly with gauze drains and closed in the usual manner. Nothing was done with the fracture of the superior maxilla other than to hold it in position by supporting the inferior maxilla with a plaster cast. Three teeth had been knocked out and through this opening he was fed through a tube. Infection developed in the wound over the frontal region which communicated with the wound of the face. The free use of the alphozone solution cleared up the infection in a few days, the other wounds healing without infection. It was necessary to remove the left eye at a later date. The patient left the hospital October 11.—*Southern Cal. Practitioner.*

The *gall-bladder,* like an ovarian cyst or a hydronephrotic cyst, will occasionally implicate an adjacent coil of bowel, and the parts in contact may become thin enough to allow of the osmosis of intestinal fluid which microörganisms which will set up inflammation.—*Bland-Sutton.*

TRAUMAS OF THE BRAIN.

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As a diagnosis of injuries to the brain often has to be made in cases where fracture of the skull also exists, it may not be inappropriate to consider briefly this latter condition before taking up the cerebral injury. Fractures of the skull, unlike fractures of other bones, are of little importance per se, but concern us chiefly because of the injury to the brain they are apt to produce. If we recall the general plan of construction of the skull we see it is somewhat spherical or oblong in shape, and consists of two tables parallel to each other. A blow from the outside to produce a fracture must force in these layers of bone until their resistance and natural elasticity are overcome. The mechanics is identical with that of a green stick fracture. Fracture of the skull is produced in a precisely similar manner, as the force applied externally first lessens the concavity of the inner table, and if continued may flatten it, or even render it convex. If the force is sufficient to overcome the natural resiliency of the bone a fracture results, and following the principles of the green stick fracture is most likely to occur at the inner table, as this point is subjected to the greatest strain, being first crushed and then pulled apart, as it is successively rendered flat and then bent and changed from a concave into a convex surface. The marked frequency of fractures of the inner table as compared with fractures of the outer table alone has been noted from ancient times. It was formerly supposed that this was due to the peculiarly brittle construction of the inner table, and following this fallacy the inner table is no more brittle than the outer; that it is more frequently fractured is due to its situation and the peculiar mechanical strain, which has just been alluded to.

Fractures of the skull are not wholly an unmixed evil. It must be recalled that the energy of every blow has to be expended in the same direction. Speaking generally, this force may be expended locally, in which case the bone at the point of injury receives the force, or it may be more diffused, in which latter case the energy from the blow is distributed more generally to all portions of the skull, and also taken up by the brain. Undoubtedly, many injuries to the skull, by expending most of the force upon the bone and doing but slight injury to the brain immediately beneath the fracture, have resulted much more favorably in the eventual outcome than would have been the case had the same amount of force been so distributed as not to fracture the skull, but to place upon the brain the burden of receiving a larger share of the energy from this blow than would have been its portion had no local fracture occurred. The question of contre-coup, which has been so frequently alluded to, does not now receive much attention as a cause of cerebral injury. It is difficult to calculate such a force in a symmetrically formed sphere, but in a bony cavity, such as the skull, the great irregularity, both in shape and in texture, renders it hardly probable that the force will be concentrated on exactly the opposite side as has heretofore been assumed. The momentum of the brain, however, which has been set in motion by the blow, will be checked by that portion of the skull opposite to the point of injury. In this way lesions of the brain may occur either at the locality of the blow or diametrically opposite where the momentum of the brain has thrown this organ against the inner layer of the skull. Then again, the injury may be so diffused or it may be so great as to be distributed through various portions of the cerebral tissue.

A case of this kind came under my observation last summer in a patient about 40, on whom a large bell had fallen. There was an injury to the scalp, but no actual fracture. He was unconscious for a few hours, then recovered consciousness though rather drowsy until twenty-four hours after the injury, when he gradually relapsed into total unconsciousness. I operated about two days after the injury. The patient was completely unconscious, but had no focal symptoms whatever; pupils were about normal and responded to light. There was no paralysis, pulse was about 90 and of fair volume, respirations were normal and easy. There was a rigid condition of his muscles in all four extremities, and all reflexes were heightened. A fly lighting upon his nose was immediately and accurately brushed away

with either hand. The skull was opened with a chisel at the point of injury to the scalp. There was a small scratch on the bone, but no marked fracture. After removing a large piece of bone in the region of the scalp injury, which was just to the right side of the median line and posterior to the motor area, the dura was opened. It was tense and pulsated very feebly. No blood clot was found, but a good deal of cerebro-spinal fluid was evacuated and cerebral pulsation improved. Gauze drainage was placed in; the dura was not sewed, though the scalp was closed. The patient seemed to be improving for twenty-four hours, though he never fully regained consciousness, and three days later died rather suddenly. No autopsy was held, but the clinical symptoms and the operation seem to indicate that the brain structure was so injured by receiving a large portion of the force of the blow that its delicate cells could not recover. This is alluded to by Phelps in the *Annals of Surgery* (December, 1906), in which he speaks of cases in which the primary shock was extended to the general mass of cerebral cells. He says the pressure from cerebral hyperemia and the resulting edema is not always the essential cause of cellular disintegration.

The symptoms necessarily consist first of those which obtain from such injury to special centers as will produce some derangement or paralysis of function, and secondly, of general symptoms which follow extensive destruction or general compression of the brain. In a severe injury, both classes are present. The focal may be from destruction of cerebral cells or may occur from pressure of a piece of bone, a foreign substance or blood clot. Often hemorrhage and injury to the brain cells exist at the same time, though when either one of these features is particularly prominent the symptoms may be classed according to the most prominent feature. When there is immediate destruction of brain cells, symptoms will disappear at once unless the function of these cells is unknown; when, however, the trouble is due solely or chiefly to hemorrhage, there is always an interval of consciousness between the infliction of the injury and the period of unconsciousness, though this interval is short when the hemorrhage is extensive. A hemorrhage of this latter character, unaccompanied by direct injury in the brain, always comes from some branch of the middle meningeal and is usually epidural. Hemorrhage beneath the dura and directly involving the cortex or the pia is accompanied by direct injury to the brain, and must be considered under the head of destruction of brain substance, and not merely as a result of the pressure of the blood clot. Traumatic hemorrhage from the middle meningeal artery may occur from a blow without any fracture of the skull and sometimes without apparent injury even to the scalp. This is well illustrated by the following case, which I reported in the *New York Medical Journal* (February 9, 1901).

Mr. R. R., age 21; previous health good. On March 4, 1900, about 9 p. m., he was struck on the head with a wooden club. He was momentarily stunned, but soon recovered and felt perfectly well. About an hour and a half after the injury he became drowsy, and within a few hours fell into a stupor. At this time he could be aroused from the stupor, but would soon relapse into the same condition. The condition was rapidly becoming worse, and at seven o'clock in the evening of March 5, the patient was referred for operation. There was a small contusion on the left parietal eminence. The patient was in profound coma. His pupils were slightly contracted, were equal, and would not respond to light; his breathing was slow and stertorous, but not very deep; the pulse was irregular and intermittent, and on the operating table, before the clot was reached, would vary from 110 to 160; the temperature was 97. The right side of his body and face was paralyzed, and the left arm and leg were in constant jerking convulsions. He had lost control of the bladder and rectum. The operation was performed an hour after the patient arrived. No anesthetic was used at first, but convulsions of the left side proving annoying, chloroform was finally given. I intended making an osteoplastic flap with the trephine and Gigli saw, but, as the patient's condition was becoming rapidly worse, and haste was demanded to relieve pressure, I trephined over the left parietal eminence and came down upon a large clot of blood. There was no fracture, not even a fis-

sure. The trephine opening was enlarged with rongeour, and a quantity of blood, estimated from 4 to 6 fluid ounces, was removed by means of the finger, a uterine curette, and small gauze mops on artery forceps. The opening was a little above the middle of the clot, which measured an inch and a half deep at its center and covered an area of about 4 inches in diameter. Only slight bleeding occurred after the clots were broken up and removed, so the space was loosely filled with iodoform gauze and a rubber drainage tube inserted. A few silkworm gut sutures were introduced and left untied. Bleeding from the scalp was free, but easily controlled by a continuous overhand suture of catgut, carried along the margins of the scalp wound. His temperature was 98.5 an hour after the operation, and did not vary as much as a half degree during the entire convalescence. Next morning the patient was conscious and answered questions intelligibly. On March 7, the dressing was changed, the gauze and tube were removed, and the sutures, previously introduced, were tied. The first week the patient was inclined to be noisy at night. Some superfical suppuration resulted, but otherwise he recovered uneventfully. He was discharged on April 9.

The differentiating between cases of hemorrhage and destruction of the brain substance is important, as the treatment often differs. When hemorrhage is the chief if not the only feature, there is always an interval of consciousness. The length of the interval depends, of course, upon the rapidity of the hemorrhage, but is rarely greater than a few hours. There are often several hours of a stupid state before the patient becomes completely unconscious or paralyzed. In hemorrhage, the temperature seldom goes over 101, though, in the earlier stages, it is usually subnormal. The pulse is full and slow at first, but later becomes weak and rapid. This phenomenon has been satisfactorily explained by Cushing, as being a conservative effect on the part of nature to maintain nutrition to vital centers in the brain. When the pressure from a clot becomes so great as to threaten the nutrition of the brain by pressure upon its vessels, the brain sends out impulses which raise the general blood pressure and increases the force of the heart. This tends, for a time at least, to overcome the extra resistance put upon vessels of the brain by the pressure of the clot until finally exhaustion sets in, the high pressure can no longer be maintained, and the pulse becomes rapid and of less force; but, as the pressure still remains upon the brain, the vital centers are affected and death ensues unless prompt relief to cerebral pressure is given. Convulsions from hemorrhage alone are rare and local spasms never occur.

On the other hand, destruction of the brain cortex without marked hemorrhage presents a different clinical picture. If the destruction is extensive, unconsciousness may persist from the time of injury, or unconsciousness may come later from edema or progressive degeneration. The rise in temperature will be marked and the pulse soon become more rapid than normal; its volume will either be unaffected or lessened. These symptoms may be modified at first by the presence of shock. Phelps, who is probably the greatest authority on traumas of the brain, says that convulsions or marked spasms of any muscle or groups of muscles are almost always due to injury to the brain substance, though general or local muscular twitching may be due to pressure of the hemorrhage or to a very mild irritation of the cortex. Probably the most important of the general symptoms is the temperature. A decided rise in temperature after the first shock has disappeared, following a blow upon the skull, even when the skull or scalp are uninjured, would indicate serious injury to the brain, particularly if such a temperature persists, whereas if hemorrhage is the chief feature the temperature rarely goes over 101. Phelps says in his extensive experience he has never seen a patient recover whose temperature following a cerebral injury rises even a fraction above 105. He calls 105 the "dead line." Injury of the brain, then, as contrasted with cases in which the pressure from hemorrhage is the chief lesion, may be diagnosed by the focal symptoms, by the absence of general signs of compression, particularly the absence of the rise in blood pressure and absence of full, slow pulse by the pressure of convulsions or local spasms corresponding to the area of

cerebral injury, and by the presence of marked temperature. If the injury to the brain is slight, the temperature necessarily is not high, nor is general consciousness lost.

The following two cases of injury to the brain are reported to illustrate some of these points. One was a comparatively mild injury and the other a severe one.

A colored boy, aged 16, with previous health good, was struck with a brick on the left side of his head, just above the ear, October 12, 1905. His hair was abundant, and there was no injury to the scalp. He lost consciousness for an hour or two. I saw him the day after the injury, when he complained of but little pain, though he had some headache; eyes reacted normally. There was a defect in his speech, which approximated an aphasia, though, as he naturally stammered, it was difficult to determine the amount of aphasia with accuracy. A few days later he entered the hospital. He was perfectly conscious, and there was no paralysis that could be detected. Certain figures he could not call except when mentioned to him and he would soon forget them. He could not always give names of common articles, such as a book. The amount of depression of the skull was general, though not very marked. His pulse was practically normal; temperature varied from about 100 to 102. On account of the persistence of these symptoms, I operated upon him on October 17. After making a large scalp flap, a depressed stellate fracture was found. The fragments were removed and a wound of the dura which was disclosed was enlarged. Underneath this there was a small cavity containing about 3 drams of disintegrated cortex and blood clots. The destroyed tissue was gently removed by irrigation with salt solution. A small soft rubber tube was inserted and the scalp wound closed. The patient made an uninterrupted recovery. His aphasia improved to some degree, showing that the local edema must have been partly responsible for it.

I. C., a colored man, aged 36; previous health good, was admitted on the 28th of December. He had fallen from a dray five days previously, striking upon his head. He was somewhat stunned, though did not lose consciousness. He was taken to the City Alms House, but insisted on going home, and, with some assistance, walked to his home several blocks away. The following day his actions were noted as peculiar, though he was not unconscious; two days after the injury he became stupid, and three days later was completely unconscious, though there were no symptoms of paralysis at any time. Four days after the fall spasms on the right side of his face developed. When I examined him on the sixth day after the injury—that is, the morning after he entered the hospital—he was unconscious. Convulsions of the right side of his face occurred at irregular intervals, sometimes as often as every half hour. There was no mark of injury to the scalp. The muscles of the right hand and leg seemed to be weaker than those of the opposite side. His temperature was 99 and pulse 84, and of poor volume; respiration, 22. He had great difficulty in swallowing. The pupils were equal and reaction slow. The following morning, December 30, his pulse was weak, irregular and about 120, his temperature 106, respiration 40. At this time he had general convulsions coming on in the muscles of the right side of his face, spreading to the right arm and then to the right leg. The left side was but very slightly involved, the convulsions being almost confined to the right side. Bearing in mind the high temperature, it was thought unnecessary to operate, though the symptoms seemed to point to an extensive lesion of the left side of the brain. He was not submitted to operation before this time because there was no evidence of general pressure as indicated by pulse or respiration, and the focal symptoms consisting solely of spasms of the muscles of the face was not considered of sufficient importance to cause profound unconsciousness. In other words, it was thought that the chief lesion was elsewhere and the injury to the face center might be of minor importance, so that an operation to relieve this condition would be of but little service. When, however, the convulsions of the whole right side in the order mentioned occurred, operation was clearly indicated as showing sufficient injury to the cortex of the left side to produce general symptoms. An hour later his temperature fell to 105; at four

o'clock it was normal and respiration 18. However, pulse was still 120, very weak and irregular, and the patient was unconscious. At six o'clock the temperature began to rise again, and was 101.2. This condition is interesting, as showing another rise beginning, which probably would have been fatal. The sudden drop in temperature was most likely due to the disappearance of the edema, which would have again appeared, as the local injury could not have been permanently overcome by the tissues. At eight o'clock p. m., on December 30, I operated, having definitely made a diagnosis of injury of the cortex with cortical hemorrhage. I turned down a large flap on the left side and opened the skull about opposite to the face center. There was no evidence of fracture, or even an injury to the scalp. The skull was opened with mallet and chisel and disclosed the dura tense and without pulsation. The dura was opened and a blood clot about ½ inch in thickness and 1¾ inches in diameter was seen. Imbedded in this clot at its under surface was a good deal of destroyed brain tissue. The clot and damaged substance was carefully removed, and a small, soft rubber tube inserted as a drain. A small amount of gauze was placed over the injured brain to control oozing. The patient's general condition when he went upon the table was very bad, as his pulse was almost imperceptible. He was given intravenous infusion of adrenalin and salt solution during the operation, and his condition improved. December 31, temperature varied from 100 to 103.2; pulse from 96 to 116, but of much better character. On January 1, his temperature at noon was 101.6, pulse 102 and respiration 26. His pulse was of good volume. On January 2, at noon, his temperature was 98, pulse 70 and respiration 20. The wound was dressed on this day and found to be in excellent condition. There was but little drainage of any kind. On January 3, at noon, his temperature was 99.4, pulse 110, respiration 22. The patient would groan and complain of pain when dressed, and when attempts were made to remove the drainage, he spoke a few words. He would take nourishment fairly well, while it was almost impossible for him to swallow at all before the operation. On January 4, his temperature went up at four o'clock in the morning to about 103, pulse 102, respiration 22. He had been sleeping during the night, and was apparently doing well. At 7:45, the morning of January 4, he died very suddenly. No postmortem was held, but death was evidently due to the extensive injury to the brain itself, though, from his marked improvement for several days after the operation, hopes had been entertained that he might recover.

The value of eye symptoms as to diagnosis and as to indications for treatment has been much over-rated. Inequality or dilatation of the pupils may occur with various injuries of widely different nature and are not sufficiently constant to indicate either the site of the injury or the character of the lesion, though they show there is some derangement of the functions of the brain, or some injury to its membranes.

When hemorrhage is the chief or only feature, operation should be performed as soon as possible, the clot evacuated and bleeding controlled if it has not already stopped. The skull should be opened in the lower parietal region, which offers easy access to the clot and the bleeding point. Cases of injury to the brain require most accurate treatment. For the localization of the injury, we must depend chiefly upon the position of the centers of the large motor area of the brain. These centers are found about the fissure of Rolando, and, according to recent experiments by Grunbaum and Sherrington, are solely in the convolution immediately in front of the fissure of Rolando and not as formerly supposed, both in front and behind this fissure. The utmost care should be taken in selecting cases to be submitted to operation after we have diagnosed the condition as a destruction of the brain tissue. There are certain cases of a "border line" character that might recover under some conservative treatment, as purgatives and application of ice to the head, when an operation may turn the tide against the patient, and by increasing the edema produce a fatal result. In the cases where focal symptoms persist without general symptoms, operation to remove the disintegrated brain matter and the local clot is clearly indicated, but when there is unconsciousness, and particularly when the tempera-

ture is high, operation should be undertaken most guardedly. It is difficult to tell just which cases in such instances should be operated upon and which should be left alone. The fatal result is sometimes not dependent solely upon the amount of hemorrhage or upon the local destruction of brain tissue. Phelps lays great stress upon the edema following such injury. The increase or decrease of the edema often causes fluctuation of symptoms, though the main lesion practically does not change. The experimental results of Cannon seem to show there are some nutritive changes due to the shock of the injury upon the delicate cortical cells, and these nutritive changes may not be dependent upon either hyperemia or edema, but can be accelerated by them and cause death. Unless the symptoms present are of sufficient import to demand operation on the one hand, or unless there is reasonable chance of giving relief in a desperate case on the other, operation should not be undertaken. It must be borne in mind that traumatic cases are different from those having a chronic lesion, as a tumor, and that the addition of hyperemia from an operation to that already existing from the trauma may be most serious.—*Virginia Medical Semi-Monthly.*

REPORT OF SURGICAL CASES OF THE SOUTHERN EMPLOYES, AT MEMPHIS, FOR 1905, 1906, AND FIRST FOUR MONTHS OF 1907.

G. B. THORNTON, M. D., MEMPHIS, TENN.

For the year 1905, there was a total of 19 cases reported, 14 of which were employes and 5 non-employes. As a rule, only the employes are treated; the non-employes being given first aid and reports made of their cases on official blanks, and the injured parties turned over to hospital authorities or their friends, as circumstances indicate.

Of the 14 employes, only 2 are deemed worthy of mention; the others being contusions, lacerations, etc., treated at their homes or at my office.

On July 26, 1905, A. C., aged 24, carpenter, sustained compound fracture of both bones upper third left leg, and a deep laceration on outside of right leg from knee to ankle. This case occurred in Memphis yard, and patient was taken directly to City Hospital, where he remained until August 31st. The deep laceration was sutured and the fracture treated with plaster, after acute inflammation subsided; he made good recovery, was furnished a pair of crutches and discharged safely convalescent in thirty-five days from date of injury.

December 8th; A. R. P., aged 32 years, engineer; injured in yard; unconscious from shock when first seen near place of accident and could not make statement. Was reported as adjusting boiler check when it burst, a piece striking him on left side of face. There was a long cut or lacerated wound on left cheek, commencing at corner of mouth, extending across the face with severe contusion and injury to soft parts and a compound fracture of inferior maxilla. Temporary dressing applied and patient removed to City Hospital.

The unusual feature of this case was the strong, regular pulse and good respiration, notwithstanding the condition of shock and unconsciousness. Some ether was given him, more as a precaution against recurring pain than for existing pain. The operation consisted in the removal of some ragged pieces of muscular tissue, the ligature of some small arteries in open wound, and the wiring together of the ends of the fractured bone. He stood this apparently very well, both as to pulse and respiration. He was placed on a table and removed from the operating room to his own room, a short distance on the same floor, accompanied by a nurse.

I followed in a very short time, almost immediately. On my arrival, the nurse called my attention to some difficulty of respiration; it suddenly became too quick. The pulse was strong and regular, but the respiration grew rapidly worse and patient died in a short time.

It is not my practice to operate during severe shock, but to await returning or complete reaction. In this case, the pulse was unusually strong and regular and respiration apparently good when we decided to operate at once.

In 1906, there was a total of 17 cases reported, 11 of which were employes.

May 5th; S. H., aged 26 years; engineer; injured May 4th about 10:30 p. m. and taken to City Hospital. Left thigh crushed. Had compound comminuted fracture of left thigh, lower third; injuries to soft parts extended to middle. When first seen, patient was weak from shock and loss of blood. Restoratives used, temporary dressings applied and operation deferred until about 10 a. m., May 5th, when thigh was amputated in upper third, circular method. Abscess and sinus subsequently formed in stump, which retarded convalescence. But he made good recovery and was discharged July 3d, with good stump; was sixty-two days in hospital. Has since returned to work as switch engineer.

One case, W. R. C., a Pullman car porter, injured while on duty, was treated as an employe. In a collision of his train with a freight train, he was thrown violently against a seat, fracturing olecranon process of right ulna. Such fractures are always interesting and have given much trouble to both surgeon and patient. This case was reported on June 22d, and discharged in good and satisfactory condition July 16th. It was an office case and treated in semiflexed position on padded metal splint, which was readjusted twice and finally removed twenty-eight days from application, union being good. The arm and joint soon regained normal condition and patient returned to duty.

August 12th; Levi P., colored, fracture of both bones left leg; treated in hospital from August 12th to September 11th. Plaster applied after acute inflammation and swelling had subsided. Made good recovery. Time in hospital, thirty days. Was discharged on crutches.

November 17th; J. C. K., aged 22 years, switchman; was making switch, hanging on side ladder of car, when struck by switch stand, which was defective, being out of proper position, was knocked off and fell under wheel. He had fracture of left wrist and compound fracture of upper third left humerus with great laceration of soft parts extending so high as to necessitate amputation at shoulder joint. Was taken to City Hospital soon after receiving injury. Left hospital December 14th and became an office patient for renewal of dressing until January 7th, when case was dismissed cured. Time, fifty-one days.

In operating on this case, the artery was first ligated in open wound and incision made through upper part of deltoid over shoulder joint. The upper part of this flap could only be closed by suture, as there was not sufficient muscle left for closing of lower part. This was left open and packed with gauze to fill by granulation, which it did with good result. I understand a damage suit has been commenced in this case, basing claim on defective switch stand.

For the first four months of the year 1907, there have been twelve cases reported, two of which were not employes. The only case I will mention is that of J. J. B., injured on April 2d, and taken soon after to the City Hospital. In a collision at night, he jumped from an engine and fell between engine and tender. Several coaches were attached. His left leg was crushed off in upper third close to knee, and a severe laceration in lower third of right thigh. This case was complicated by severe shock and quick, weak pulse from loss of blood. It was a question whether or not to await complete reaction or to amputate left thigh above fracture with a returning reaction. Patient was conscious with good respiration, though showed a weak pulse from loss of blood. After consultation, it was decided to use normal salt solution intravenously to sustain volume of pulse and operate that night, all necessary facilities being at hand. Ether was used as anesthetic. The pulse responded to the salt solution and he stood the operation apparently well. His condition after being moved to his bed gave hope of success. Bags of hot water were placed in his bed and ¼-grain of strychnia given hypodermically every three hours. Operation completed about 1 a. m. Patient died at 2:30 p. m.

The remaining cases reported in this year were of a minor character, such as contused and lacerated wounds, etc., not worthy of further mention.—*Virginia Medical Semi-Monthly.*

True *tic doloureux* hardly ever begins in the first division of the fifth nerve.—*Hutchinson.*

Notices and Reviews.

"Surgery: Its Principles and Practice." In five volumes. By 66 eminent surgeons. Edited by W. W. Keen, M. D., LL.D., Hon. F. R. C. S., Eng. and Edin., Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia. Volume II. Octavo, 920 pages, with 572 text-illustrations and 9 colored plates. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener & Co., 1907. Per volume: Cloth, $7 net; half morocco, $8 net.

The second volume of this work deals with the various structures of the body under separate headings, for instance one subject is "Diseases of the Bones," another "Fractures," another "Orthopedic Surgery," still another "Surgery of the Lymphatic System," and so on. Whether such an arrangement is preferable to a strictly regional arrangement, treating of all the diseases and injuries of one anatomic region of the body in one division of the work, is a matter for individual choice.

In reading this volume one is struck with the fact that surgical literature has grown so vast that even in a five volume work much selection and condensation of material is necessary. It can be truthfully said that in the present volume this selection and condensation shows good judgment and careful editing.

The longest chapters are those on "Fractures" and on "Orthopedic Surgery," the former having more than 200 pages, thus permitting of full and satisfactory consideration of this most practical branch of surgery. The article is abundantly illustrated, and is more complete than is ordinarily found outside of special treatises. As an example of how thoroughly abreast of the times the author keeps may be mentioned under treatment of fracture of the neck of the femur, the description of the Ruth-Maxwell method and Royal Whitman's method of treatment in a cast with limb abducted. In this connection the author says, in regard to Hodgen's splint: "This splint is not so extensively employed at the present time as in former years, but deserves to be." With this opinion as to the merits of the Hodgen splint the reviewer heartily agrees.

The chapter on "Orthopedic Surgery" is quite full enough for the general surgeon and is well illustrated.

This volume also contains another chapter of interest to those who do emergency surgery, namely, the chapter on "Dislocations."

One chapter of especial interest to railway surgeons is that by Dercum on "Traumatic Neurasthenia, Traumatic Hysteria, and Traumatic Insanity." This brief chapter gives in a succinct manner the present status of opinion on that previously more or less obscured subject going under the name of "Traumatic Neuroses."

On the whole it is a volume which the surgeon will find satisfactory to have at hand. If he wishes to read more extensively on any subject, he will find many references at the end of each chapter. S. C. P.

Lippincott's New Medical Series, Edited by Francis R. Packard, M. D. Röntgen Rays and Electro-Therapeutics, With Chapters on Radium, and Phototherapy, by Mihran Krikor Kassabian, M. D., Director of the Röntgen Ray Laboratory of the Philadelphia Hospital, etc. Philadelphia and London: J. B. Lippincott Co., 1907. 545 pages, 245 figures. Cloth, $3.50 net; half-leather, $4 net.

This work strikes us as one of the best balanced that has appeared thus far on the vexed subject of the x-rays. It is divided into three parts, devoted to Electro-Therapeutics, the Röntgen Rays in Diagnosis, and Radiotherapy, Radium and Phototherapy, respectively.

Part I takes up the elementary principles of electricity and magnetism, and does not go into these subjects with all the pedantic detail found in some other works.

Part II which embraces most of the work (340 pages), takes up the x-rays from every standpoint—care of the apparatus, technic, clinical applications to the various organs and in the specialties, including dentistry and medico-legal work, etc.

The last 130 pages are devoted to an account of radiotherapy and phototherapy, in which full justice is done to the Finsen light treatment.

There are no extravagant claims made for these remedial agents and the work leaves the impression of a well digested and orderly presentation of the facts embraced by its title. There are numerous illustrations, and, of course, the mechanical part of the book is satisfactory in the extreme. J. F. W. H.

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[NOTE.—This report of Dr. Hays has been reprinted in pamphlet form. We shall be pleased to send a copy of it to any physician upon request.]

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PUBLISHER'S DEPARTMENT

S. Leon Gans, M. D., Instructor of Genito-Urinary Diseases in the Medico-Chirurgical College and Assistant Genito-Urinary Surgeon to the Medico-Chirurgical Hospital, Philadelphia, publishes his extensive experience with colloid silver in acute gonorrhea. From his study of 132 cases he concludes: Instillations of the drug caused subjective symptoms of irritation. The must striking feature in the entire series was the absence of epididymitis in all cases. There were no complications in any case, unless posterior urethritis is so called; and this was minimized. All cases ran a much shorter course than under other plans of treatment. The long stage of decline was conspicuous by its absence. There was no sudden cessation of the acute discharge followed by a persistent mucoid discharge, as with many cases treated by the old irrigation methods.

Three to 5 per cent collargolum solutions with mucilage sassafras med., being preferable to watery solutions, were injected as soon as the patients presented themselves. The instillation is made with the greatest care and gentleness four times a day, immediately after urination, the instillator being placed just within the compressor urethræ muscle. This insures medication of the infected membranous and prostatic urethra; if introduced farther the instillator deposits the fluid on the base of the bladder, which is rarely at fault. The solution is held five minutes, the meatus being compressed laterally. The urine should be watched, and persistent turbidity not due to phosphates or urates is an indication to decrease the strength of the solution. Number and concentration of the injections should be adapted to the individual needs.

Thirty minutes after a 5 per cent collargolum solution had been thrown in and held for 5 minutes, a normal urethra was examined with a straight tube endoscope with an electric bulb. The mucous membrane was found to be stained brown and to have a peculiar lustre, and small areas of normal tissues were apparent at irregular intervals.

The author appends a table which shows the characteristic effects of collargolum in twelve typical cases taken at random.—*The Medical Bulletin,* February, 1907.

SCOPOLAMINE NOT HYOSCINE.

In the *Archiv für Gynaekologie* Steffen gives some interesting details as to the use of scopolamine-morphin by Leopold. The latter has employed this method in 300 labor cases. His verdict is that the method does not accomplish the desired results, it cannot be regarded as harmless for mother and child, and in private practice the by-effects liable to develop may render medical aid requisite at any moment. When men come to conclusions so opposite as those of Leopold and those reported by Gauss, we, to whom each observer is equally trustworthy and free from bias, can only attribute the diversity to a difference in technic. That this is so may be seen by Gauss' examination of Hocheisen's method. Gauss secured a specimen of the solutions employed by Hocheisen and tried them in ten cases, the results being far worse than those reported by Hocheisen. Every objection raised by Leopold has been examined and disproved by Gauss in his much larger experience. Weakness of the pains did not occur to any material extent, more frequently or more markedly than in cases where this anesthetic was not used, nor were version and forceps required with greater frequency. The vomiting could only have been accidental, since it did not occur in Gauss' cases, excepting when it had commenced before the anesthetic was given. So also as to the perils to the child; Gauss showed that the mortalities of both mother and child were much less than they had been before this anesthetic was employed.

The extract, as presented in *The Journal of the American Medical Association,* gives palpable evidence of anxiety to make out a case

against this anesthetic method. Even Gauss is made to rank as an objector to the method, by quoting eight troublesome cases which occurred, out of his one thousand; just as if such things never happened unless scopolamine was employed. To any one who wants the whole truth, and not a garbled *ex parte statement,* we refer to Gauss' statistics as given by Holt, in the May number of *The American Journal of Clinical Medicine.* But even were the account given a fair one, the reader will note that it nevertheless relates to the use of scopolamine, which, as commercially presented, *is not the same thing as the hyoscine used in America.* It is much as if men should insist that, because Germans injure themselves by drinking too much beer, we in America should abstain from coffee.

The above being the gist of our knowledge of this subject to date, and the therapeutic difference between hyoscine, a true alkaloid, and scopolamine (or so-called hyoscine from scopola —a serious error of nomenclature) a mixed, uncertain product, being well established in favor of hyoscine, we caution our readers who are interested (and all should be) to use only H-M-C Abbott (hyoscine, morphin and cactin comp.), the original American product.—*The American Journal of Clinical Medicine.*

In a paper read before the San Angelo District Medical Association (*Texas State Journal of Medicine,* March, 1907), Dr. I. L. Van Zandt, of Forth Worth, reviews some of the publications on collargol and records his own experience with it in septicemia, scarlatina, phlebitis, erysipelas, bubo, paronychia, acute salpingitis and exacerbations. He also gave it in thirteen cases of typhoid, with an average of 19.8 days from the first to the last visit. This includes one with intercurrent pneumonia and two who suffered a set-back from excitement and overeating. In two cases the temperature had fallen to 99°; when the remedy was discontinued, the temperature remained stationary for a few days and then again rose till collargol was resumed, whereupon fever disappeared in three days. In most cases there was marked improvement with general well-being in two or three days after beginning the treatment, the fever somtimes coming to a very abrupt termination.

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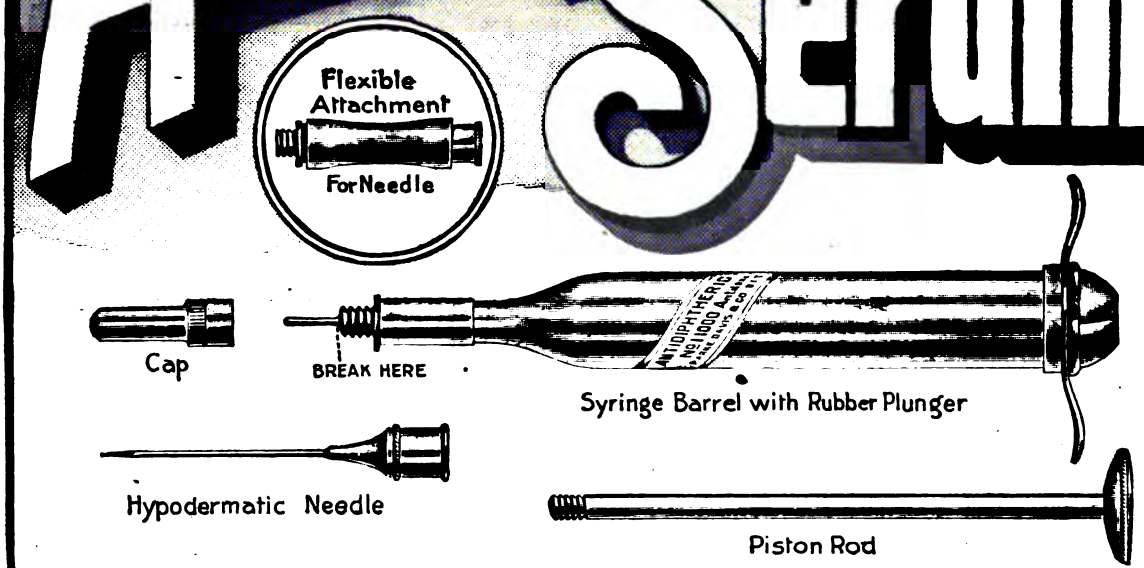

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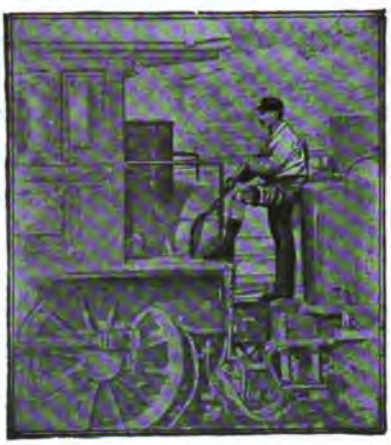

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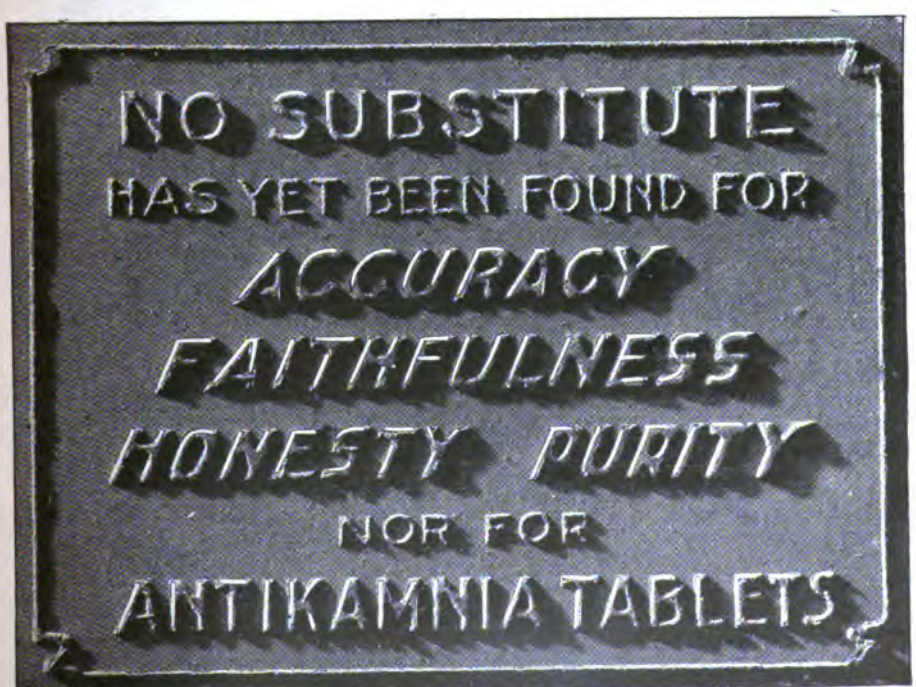

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THE Railway Surgical JOURNAL

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FOURTH ANNUAL MEETING AMERICAN ASSOCIATION OF RAILWAY SURGEONS, CHICAGO, OCTOBER 16, 17 AND 18, 1907.

OCTOBER 16TH, 10 O'CLOCK A. M.

The meeting was called to order in executive session by the President.

Minutes of the previous meeting were read by the Secretary and approved.

Upon the call for the report of committees, the Chairman of the Judiciary Committee, Dr. J. E. Owens said his committee was ready to report upon the amendment to the by-laws which had been referred to it and recommended the adoption of the same.

REPORT OF JUDICIARY COMMITTEE.

The following amendment to Article IX of the By-Laws was presented in the regular way at the last meeting and referred to the Judiciary Committee for action at the forthcoming meeting:

"The annual dues of the Associate members shall be $2.00 and the dues for the delegates shall be stricken out."

The above amendment was offered because of the fact that many of the delegate members objected to paying $1.50 delegate dues and thought it an injustice to demand it. To obviate this and not reduce our income, it was thought the above amendment would be the only remedy. By the adoption of said amendment, the annual dues of the Associate members would be increased $.50 each. Article IX as it now stands reads as follows:

Section 1. The annual dues shall be:

For the permanent members.....$5.00
For the delegate members..... 3.00
For the associate members..... 1.50

Section 1. As amended:

The annual dues shall be:

For the permanent members.....$5.00
For the associate members..... 2.00

DR. J. E. OWENS, Chicago, Chairman.
DR. J. F. PEMBER, Janesville, Wis.
DR. O. B. QUINN, McComb, Miss.
DR. J. L. CROOK, Jackson, Tenn.
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DR. J. P. KASTER, Topeka, Kan.
DR. A. H. ANDREWS, Chicago, Ill.
DR. D. S. FAIRCHILD, JR., Clinton, Iowa.
DR. A. F. JONAS, Omaha, Neb.

Upon motion, seconded and carried, the amendment was unanimously adopted.

There being no further business in executive session the executive session was declared closed, and the Association immediately reconvened in general session.

GENERAL SESSION.

The minutes of the previous meeting were read and approved.

Upon motion made and seconded, the reading of the President's address was deferred until a later period, in order that there might be a fuller attendance.

The first paper to be read was by Dr. Archibald G. Thomson, of Philadelphia, entitled "A Lantern for the Detection of Color Blindness—Lantern Model No. 2," the working of the lantern at the same time being shown. Discussion was participated in by Drs. A. H. Andrews, Chicago; O. B. Quinn, McComb, Miss., and J. E. Owens, Chicago, Dr. Thomson closing.

The next paper read was by Dr. A. H. Andrews, Chicago, entitled "Defects of Hearing and Their Relation to Enginemen." Discussed by Drs. A. B. Brumbaugh, Huntington,

Pa., and J. D. Seba, Bland, Mo., and Dr. Andrews closing.

The last paper on the morning program, entitled "Observation on the Treatment of 5,000 Injured Railway Employes and Passengers Without a Case of Tetanus, and but One of Delirium Tremens," by Dr. J. P. Webster, Chicago, was then read, and discussed by Drs. J. D. Milligan, Pittsburg, Pa.; A. B. Brumbaugh, Huntington, Pa.; A. R. Mitchell, Lincoln, Neb.; J. E. Owens, Chicago; J. S. McDonald, Cameron, Mo.; L. C. Henley, Chicago; J. H. Stealy, Freeport, Ill.; W. S. Hoy, Wellston, Ohio. The discussion being closed by the writer.

Motion made and seconded that the President's address be read at three o'clock of the afternoon session. Carried. Adjourned.

OCTOBER 16TH, 2 P. M.

Meeting was called to order, Dr. Cavana in the chair, and immediately convened in executive session.

The minutes of the morning session were read and approved. There being no business to be considered, the executive session was adjourned and the Association reconvened in general session.

GENERAL SESSION.

The minutes of the morning session were read and approved.

The paper passed at the morning session, entitled "The Importance of Careful Physical Examination of Applicants for Employment," by Dr. B. C. Brett, Green Bay, Wis., was read.

In accordance with the motion adopted at the morning session, President Hoy then read his address.

PROCRASTINATION, THE FEARFUL CAUSE OF THE GREATEST MORTALITY IN SURGICAL CASES.

"The condition under which men lived up to the beginning of the last century all tended to differentiation of nationality to the formation of fixed type and to the permanency and perpetuation of local ideas and customs.

"Whether all mankind sprang from a single stock or from several, I do not pretend to know, but as far back as I am able to trace history or traditions, the differences among them were as marked as they are now, and the general supposition has been that they would always continue. With the coming of steam and electricity, however, and the vast tide of emigration to this country, conditions changed. Distance was annihilated, communication became general over wide areas, and the hardy and enterprising members of different races found themselves working shoulder to shoulder on this continent, subduing the wilderness and pushing back the frontier, and attempting to arrive at, at least, that which would be of a satisfactory character to mankind generally."

Taking all these conditions into consideration, it is but natural that we, the American people, should have uppermost in our mind only one thought,—that of advancement, progression and a satisfactory elucidation of the many complex problems which from time to time confront us in every avenue of surgical life.

In the last three or four decades there has come a great influx of Italians, Jews, Austrians, Hungarians and Russians, and with them the same process has become—mingling with each other and with the descendants of earlier comers, and this amalgamation will no doubt greatly increase as time goes on and gives us a freer and more apt conception of the things scientific, which we must of necessity solve.

Every aspect of nature and all the manifestations of her forces express something—suggest something. Why not we? In her rugged mountain ranges and towering peaks, strength, grandeur and sublimity are imaged forth. Her fertile valleys and winding streams, her verdant slopes and rounded hill tops, the lovely flowers with which she adorns herself—all tell of the quiet beauty and peacefulness which lie near nature's heart and bathe in nature's stream of investigation. The rushing torrent, the cyclone, and the rolling thunder speak of the majesty of her irresistible power, and the laughing, dancing streamlets join with myriad songsters in giving voice to the exultant joy and gladness Nature feels when relieved by early scientific interference. All Nature is expression—frank and full of the scientific essence that lies back of it. In the animal kingdom in its highest manifestations, the same thing is absolutely true. Whatever they are, whatever they feel or design, finds untram-

meled expression. In his primitive state, it was doubtless equally true of man, but as he has progressed in civilization he has learned in varying degrees, in different races from reasons, some of which we cannot fathom, to conceal what he really is and to refrain from the free and natural expression of what he thinks and feels.

In the preparation of this paper I have certainly been forcibly impressed, and have many times asked myself the question—why is it the race which we term the Anglo-Saxon, is so little given to expressing what they feel. It would be probably impossible to explain beyond saying that is the way they are made, and have little by little doubtless made themselves. Which is doubtless a natural tendency, and all things considered, one to be *discouraged* and *restricted.* We have cultivated and developed it, until, to be in the least degree effusive, or permit ourselves under any stress of circumstance to betray natural anxiety or suggestion have come to be considered "bad form." It not infrequently happens that accident, position, reveals the fact that a person of almost icy exterior is possessed of the warmth and kindliest feelings which he has taught himself to suppress—just so in the consideration of a subject so vast in extent, so unlimited in the benefits which it embraces, and so important to the interests of science we frequently lose sight of, because we do not give expression to our thoughts. We are fully aware that the vast majority of professional men are skeptical in a large measure touching many important scientific considerations. While we have not all had the same degree of experience, or been gifted with the same opportunities, when we are confronted face to face with so important a question, as is involved by the title of this paper, we must at least admit that we have before us a subject which needs the closest care and study. Have you ever stopped to think of the vast number of little expressions which we have from time to time heard, such as "A stitch in time saves nine," "Strike while the iron is hot," and perhaps a hundred of like purport, each had its meaning, yet we, in a careless and perhaps indifferent way, were lost to its rightful appreciation.

When we take into consideration the seriousness of the question of procrastinating in operative cases, we must be guided in a large measure by the experience of those men who have worked long and earnestly, uncomplainingly, untiringly, in the great fields of surgery. These men have gathered the sheaves, and are now depositing in the great granary of science the harvest which they have reaped. I need only mention our nation's greatest surgeon to convince you that he himself has given attention to this subject of the evils of procrastination. Follow his language, listen to his scientific teachings, read his writings, study his suggestions,—and they all point to a master mind dealing with a massive subject. I have no hesitancy in saying that among all the great surgeons of our day and generation, to my mind, with due respect to them all, I think that John B. Murphy, as a writer, as a clinician, as a diagnostician, and as a skilled operator, stands in a class by himself, and when I take the liberty of freely quoting him in the following, I do so, realizing the fact that I am giving to the surgical world the most precious pearl from the gems of wisdom.

Men of all times, of all ages, of all generations, and of all languages, have toiled long and arduously in the great fields of scientific and surgical research. I can see today in the grand temple of surgical wisdom those old master spirits of the profession, and as they go about from place to place, I see in their hand the torch of science which has been transmitted from generation to generation, until today we are nearer arriving at a more perfected plan of examination and treatment of surgical cases than ever before in the history of our profession. Well can I recall the days of my student life when that grand, good man, that Father of American Surgery, Samuel D. Gross, my preceptor, laughed at the idea of bacteriologic existence. He lived his day of usefulness, he died in harness, but in his day and generation, when "laudable pus" was found he did not hesitate to operate. These are the master spirits who once lived, will ever live,

and the suggestion which they made to us, regarding operations, we hesitate now to accept because of changed conditions.

It is certainly gratifying to note the advancement which has been made, and particularly the strong trend of surgical endeavor in the direction of a satisfactory diagnosis. The time will not only come, but it is here now, when even a satisfactory diagnosis will place at ease, or be a pointer, as approaching the zenith of surgical attainment. The public are becoming more exacting each day. The laity are gradually becoming educated up to a point where they are exacting in the extreme. The doctor who relies upon the maybe's and perhaps's will be relegated to the rear and fossilized to that degree that microscopy will be tested to its extreme, to even approximate the year in which the individual lived.

Doctor Murphy has truthfully said:

"Surgical procedures, in order to attain their ideal, or even to be life-saving, must be timely. In how many cases in a hundred elective operations, performed by surgeons, can they truthfully say the operations were timely? Operations on the heart are increasing in frequency, and in favorable results. Pericardotomy for cardiac inspection or drainage is a frequent performance. Thoracic and pulmonary surgery are becoming more aggressive. Much knowledge of a practical character has been added to our store in acute, as well as chronic, lesions of the pancreas. Subcutaneous injection of antitetanic serum, as a prophylactic, is certainly indicated and its early administration after the tetanic symptoms are manifest, has reduced the mortality 50 per cent. Experience has taught us that the peritoneum should be treated with the greatest respect; the exposures, handling, sponging, and irrigation should be avoided in the extreme, particularly in the presence of infection. We must cease milking, pressing, curetting, sponging and irrigating acutely infected cavities and surfaces. They should be drained for relief of pus pressure, possibly chemically cauterized, and then treated with masterly inactivity. These principles apply to acute lacerations, contusions, punctures and stab wounds. In rendering the surface aseptic, do not infect the wound with the water or solution. Antiseptic has precedence over aseptic means in traumatic surgery.

"The surgery of the pancreas has materially advanced, and the etiologic relations between its diseases, and the obstructive and infective lesions of the bile ducts has been clearly established. Gall-stones and the infective diseases of the gall-bladder and ducts are now uniformly recognized by their early manifestations, and timely operations are performed. There is still, however, a lamentable delay, and a still more lamentable effort at justification for this delay by a small minority. To this procrastination is attributable practically all of the deaths which now follow operations on the biliary tracts.

"The number of operations for diseases of the stomach other than malignant, have been enormously increased, and the results of these procedures have been little less than brilliant. The duodenum has fared even better in this particular. We can now say that our former ideas and interpretations of the symptomatology of many lesions of the duodenum and stomach were fallacious. The surprises of the surgeon in his discovery of gross pathologic lesions, with few, if any, of the classic symptoms to indicate their presence before the operation, have been many and striking. So many lesions of the stomach are of such chronic character that the symptomatology of the earlier stages of the diseases was forgotten or overshadowed by that which immediately preceded the post-mortem findings. Now, the anatomic conditions as observed "in vivo" by the surgeon, proves an entirely different relationship between the symptomatology and pathology in the early stages of the disease.

"The surgery of the large intestine has participated in a less degree in the improvement during the year.

"Operations on the esophagus have been encouraged by modification of technic, but they are yet far from satisfactory.

"Peritoneal surgery has yielded better results than in any previous period. This is due to recognition of the fact that trauma, manipulation and irrigation of the peritoneum in acute infectious processes are injurious and dangerous. That a normal peritoneum is in much greater danger of accepting and absorbing infective flora, than a subacutely inflamed or irritated one. That the best results in peritoneal infection are obtained by cutting off the source of supply of infective material with simple drainage of the cavity. That Callender's expression of a half century ago concerning phlegmons and abcesses is today applicable to the peritoneum, *i. e.*, 'that they should not be milked or manipulated.'

"The number of conservative operations on the kidneys is rapidly increasing, as are operations on the upper and lower ends of the ureter also.

"The results of operations on the prostate are

becoming more and more satisfactory, until statistics that would have been doubted a year ago, are now accepted without hesitation.

"The anastomosis of nerves for relief of paralysis has been very gratifying, and the degree and limitation in the regeneration of nerves after excision or division has been thoroughly established. This is particularly true of the trifacial. Excisions of the dura and cortical substance of the brain for traumatic epilepsy, has added a little to our hopes in this class of cases.

"Splenectomy for trauma gives a brighter promise. Suture for splenic, hepatic and renal hemorrhages has yielded better results than the packing system formerly adopted.

"Arterial and venous surgery, as well as the surgery of the heart, has given good practical reward for the experimental work of the few preceding years. The recrudescence of the surgery of the bones and joints is very marked, and the results show how much can be accomplished in a conservative sense for the deformities and diseases of these parts. The etiology of cancer and sarcoma is still undiscovered.

"The day of lacerating, retracting, contusing, compressing and traumatizing tissue and organs in operation is passing. There is a growing admiration for systematic and artistic operative work, and with its diminution of the deaths from surgical shock and sepsis and convalescence is less protracted.

"The tympanum and mastoid must be drained before the meningitis ensues. Aneurisms must be treated before they rupture, not after. Cardiac and vascular puncture must be sewed. Ante- not post-mortem pulmonary hemorrhages, must be stilled, without the assistance of death. The hepatic cholangic and cystic infection must be drained before fatal sepsis ensues. The gastro-intestinal and appendiceal ulcers must be treated before the onset of fatal peritonitis. The ureteral, prostatic and urethral obstructions must be removed before the excreting tissue of the kidney is destroyed.

"Technical procedures have been so perfected that mortality in many of the grave surgical lesions has been reduced to a minimum, and the subject has ceased to be of active interest. It is followed by a keen appreciation of the fact that not only must the patient's life be saved, but that he must also be freed from pain and other discomforts. This statement is particularly applicable to gastric, biliary, intestinal, vesical and genito-urinary surgery. Conservation of organs and tissues is rapidly supplanting the pan-operations of the past decade. Surgeons are becoming more exacting in their demands for better functional results and more uniform lines of practice.

"Surgery of the duodenum and its afferent ducts has attracted great attention, and much has been achieved. The results in gastric surgery are more uniformly good, and the lines of procedure clean cut and generally accepted. Splenectomy results have been gratifying and have definite indications for their performance. Caution and conservatism in interference with or removal of secreting kidney structures are the significant watchwords of renal surgery. The greatest achievement in life saving results has been in general septic peritonitis by limited operation and limited manipulation. The laity, physicians and surgeons are learning to value the life-conserving significance of timely operations, which have robbed apppedicitis of its mortal septic peritonitis, have anticipated the fatal sepsis and jaundice of cholelithiasis, and are exerting an enormous preventive influence against cancer of the stomach by curing the gastric ulcer, its most potent and frequent cause, and relieving the etiologic pre-cancerous gastric stasis. The limitations of surgery of the spinal cord are clean cut, based upon the knowledge of absence of regeneration of certain neurons. The divided peripheral nerves can no longer be overlooked with impunity any more than the displaced fracture or the luxated joint. The same may be said of the severed tendon.

"The field of surgical or mechanical therapeutics is each year becoming more extensive, and many hitherto incurable pathologic conditions are yielding. Biology and chemico-biologic knowledge are rapidly advancing in their practical, preventive and therapeutic results.

"Immunity and autogenetic resistance are more clearly understood, and the fluids of the body, which have been ignored since Virchow founded his cellular pathology, are assuming a very important rôle, as shown by their opsonic properties. The recognition of the opsonic principle is the most important forward step in our knowledge of sepsis since the demonstration of the phagocytic function of the lymphocyte; it is a most promising field for investigation.

"Therapeutic nihilism is no longer the professional fad; it has been a great etiologic factor in the development of "isms" in and 'science,' etc., out of the profession. The public is justly demanding relief from suffering and pain; it will not further tolerate the stilted, professional-satisfying knowledge of pathology and diagnosis of the graver organic diseases only; it demands therapeutics for its pains and discomforts. Suffering is the same to the patient whether it has a functional or organic etiology. The eradication of symptoms is ex-

acted after surgical operations as well as the extirpation of the foci of disease.

"The elements of shock are better understood and are accordingly avoided and treated with greater precision. The surgery of cerebral neoplasms has advanced but little; the results of early drainage of intra-cranial ventricular and sub-dural infections have materially improved, and early drainage will soon become the regular practice. The indications for—and limitations of—surgery of the spinal cord and peripheral nerve lesions have been established on a historic basis, and more uniform results are now obtainable.

"The results in operations for stab and bullet wounds of the heart are much better than we hoped for and are each year improving. This cannot be said of pulmonary wounds.

"All through the field of abdominal surgery, early and exact diagnosis with prompt operations and improved technic are constantly producing better results, with one notable (and I must say, inexcusable) exception. According to Dr. Coffey's statistics, the mortality in appendicitis, in large hospitals, is still too great, clearly resultant from delay in the patients' appearance for surgical relief. It seems that the time for legal recognition of, and punishment for, delay in diagnosis and operation for appendicitis is due, and unless the profession awakens to its shortcomings an enactment will soon be placed on our statute books. The practice of procrastination in all acute infections, particularly in those so readily recognized and so amendable to timely treatment as purulent meningitis, acute osteomyelitis, perforative peritonitis, appendicitis, cholecystitis, etc., should no longer be tolerated by the profession, and will not be by the public. Operative intervention in malignant diseases is becoming more timely, and so far is the only ray of hope for carcinoma and also sarcoma, except through the toxins which are yielding better results.

"Fractures have been too much neglected in the modern surgical amphitheater and text books and the percentage of bad results is proportionately increasing; imperfect reduction, improperly-applied splints and casts and prolonged immobilization still produce their pernicious sequelæ.

"If the early signs and symptoms of surgical tuberculosis were recognized in practice as they should be, many of the evils of the advanced lesions might be avoided."

I would in an especial manner invite your attention to that class of cases whereby prostatic enlargements and inflammatory results have been encountered and in which it is most difficult for the surgeon to arrive at a proper time for operative intervention. It is safer in cases of doubt to operate early, thus avoiding subsequent complications.

I wonder how many surgeons of our land, and members of our organization, are today giving careful thought and contemplation to the great importance of what we term "traumatic surgery"? I wonder how many of them would agree with me when I say that this question of traumatic surgery is bound to be the greatest of the surgeon's field of operative ability? We realize that in this field of work along lines of traumatic surgery a different set of rules, in a majority of instances, must be applied. I realize that no man would be so foolish as to attempt an extensive operation while his patient was lying in profound shock. I can well understand during the delay, incident to such shock, what the surgeon would be doing, but even with these considerations before us, I do not hesitate to make the prophecy that traumatic surgery is bound to be the most important branch of the surgical art, and with this, we can safely say, it is bound to be the most satisfactory.

With the abolishment of the probe, and with the dread of an infected finger, our patient's chances in a vast number of traumatisms will be wonderfully increased. Meddlesome surgery, we scarcely find to any great degree at the present time. What is more important than any other consideration in surgery is, first, a certainty of diagnosis, and second, a judgment to quickly or judiciously act. No matter what may have been our original opinions regarding the time at which an operation should be performed, we must all admit that in a number of instances, not only in private practice, but in a number of well regulated hospitals, far too many cases have been permitted to die, simply because there was uncertainty as to the proper time for operative interference.

The question of timely treatment is one which will not be downed. We may dodge the subject, we may procrastinate and call it conservatism, but it is not. We have no right to take any patient's life in our hands and by timidity, doubt and uncertainty and procrastination, rob him of that which we cannot restore. I recog-

nize fully how very difficult it is at times for the surgeon to make up his mind hurriedly, touching an operative case.

For instance, we take a case of appendicitis, and the very first indications of which you are all aware in a diagnostic point of view, you have no right, if from that one symptom alone, pain and vomiting, to place the patient's life in further jeopardy by delay in operation, as we know the generality of all types of this disease, taken collectively, reaches in the neighborhood of perhaps 5 per cent. When we reflect that hardly twenty-five years have elapsed since the American profession have had their mental eyes sufficiently opened to recognize that there was such a disease as appendicitis, and America has forced the rest of the world to recognize, we are astounded today to know that at scarcely a cross-road throughout the country, operations have been attempted during the past few years at all stages of the disease without that regard, perhaps, which should have been given of asepsis and antisepsis.

I would, as a last request in this address, urge upon you, secure a more perfect history in all your cases. Let every detail be noted and follow up your history with a diagnosis founded on intelligent investigation, and operative ability to meet every requirement. How many cases are today going about our streets absolutely dving from want of not only proper diagnosis, but prompt surgical treatment? Could I more forcibly call your attention to this than by citing you to the many cases of empyema that should have received not only an early diagnosis, but prompt treatment? I trust the day will come when we will no longer *procrastinate* in surgical cases and by *promptness* relieve ourselves of being considered as one of the factors in the great mortality that now confronts us, as a result of procrastinating.

Paper entitled "First Care of the Injured," by Dr. D. W. Beattie, Neligh, Neb., was then read, discussion being participated in by Dr. J. D. Milligan, of Pittsburg, and Dr. E. S. McDonald, Cameron, Mo.; Dr. Beattie closing.

The paper entitled "Dust," by Dr. F. H. Blackman, Geneva, Ill., was then read and discussed by Dr. E. M. Eckard, Peoria, Ill., and Dr. J. D. Seba, Bland, Mo.; Dr. Blackman closing the discussion.

The next paper on the program, "Tetanus," by Dr. G. W. Thompson, Winamac, Ind., was read, discussion being participated in by Dr. J. H. W. Meyer, La Porte, Ind.; Dr. M. Cavana, Sylvan Beach, N. Y.; Dr. I. K. Parker, New Hampton, Iowa; Dr. E. M. Eckard, Peoria, Ill.; Dr. E. F. Woods, Janesville, Wis.; Dr. J. D. Milligan, Pittsburg, Pa.; Dr. G. W. Griffiths, Louisville, Ky.; and closed by the essayist.

The last paper on the program, entitled "Enucleation of the Eyeball," by Dr. J. D. Seba, Bland, Mo., was read, and discussed by Dr. J. H. W. Meyer, La Porte, Ind., the author closing. Adjourned.

OCTOBER 17TH, 10 A. M.

Meeting was called to order by the President in executive session. Minutes of the previous meeting read and approved. There being no business to be brought before the Association, the meeting was adjourned and immediately reconvened in general session.

GENERAL SESSION.

Minutes of the previous meeting read and approved.

The paper passed at the previous meeting, entitled, "First Aid Treatment," was read by Dr. J. A. Davis, Farmer City, Ill., and discussed by Drs. G. F. Beasley, Lafayette, Ind.; H. Philler, Waukesha, Wis.; G. W. Yeakley, Bowie, Texas; A. B. Bowen, Maquoketa, Iowa; J. D. Milligan, Pittsburg; Dr. Davis closing.

It was moved and seconded that if an author be absent when his name is called in the order in which it appears on the program he may be again called at close of the session, after which he is not to be called again except in cases of special order. Carried.

Paper by Dr. S. L. Ensminger, Crawfordsville, Ind., entitled "Amputations at the Knee-Joint," was read, and discussed by Dr. J. D. Milligan, Pittsburg; Dr. O. B. Quinn, McComb, Miss.; Dr. S. R. Miller, Knoxville, Tenn.; Dr. F. H. Blackman, Geneva, Ill.; Dr. H. Philler, Waukesha, Wis.; Dr. J. A. Davis, Farmer City, Ill.; and Dr. G. F. Beasley, Lafayette, Ind.; Dr. Ensminger closing the discussion.

The next paper on the program, entitled "Injuries to the Hand," by Dr. W. H. Baldwin, Memphis, Tenn., was then read, and discussion was participated in by Drs. J. L. Crook, Jackson, Tenn.; A. G. Servoss, Havana, Ill.; E. S. McDonald, Cameron, Mo.; E. W. Haradon, Jesup, Ia.; G. F. Beasley, Lafayette, Ind.; Hugh Jenkins, Preston, Iowa; C. B. Brown, Sycamore, Ill.; W. H. Condit, Minneapolis; F. T. Fort, Louisville, Ky.; D. W. Beattie, Neligh, Neb.; J. R. Hollowbush, Rock Island, Ill.; H. Philler, Waukesha, Wis.; H. Reineking, Milwaukee; E. J. Waddey, Waterloo, Iowa; and by Dr. Baldwin in closing.

OCTOBER 17TH, 2 P. M.

Meeting called to order by the President in executive session.

Minutes of the previous meeting were read and approved.

There being no business before the executive session, it was adjourned and immediately reconvened in general session.

GENERAL SESSION.

Minutes of the previous meeting read and approved.

The first paper on the program, entitled "The Relation of Trauma to Pulmonary Tuberculosis," by Dr. W. A. Evans, Chicago, written by invitation, was then read by Dr. Evans and was discussed by Dr. H. Philler, Waukesha, Wis.; Dr. H. Reineking, Milwaukee; Dr. W. H. Baldwin, Memphis; Dr. E. H. King, Muscatine, Ia.; Dr. A. B. Brumbaugh, Huntington, Pa.; Dr. H. B. Hemenway, Evanston, Ill.; and Dr. D. W. Beattie, Neligh, Neb.; Dr. Evans closing.

Paper entitled "The Relation of Trauma to Appendicitis," by Dr. D. S. Fairchild, Clinton, Iowa, was in the absence of the essayist read by Dr. Louis J. Mitchell, following which the paper entitled "Traumatic Appendicitis," by Dr. E. P. Sawyer, Sioux City, Iowa, was read by the author and the two papers were discussed jointly. The discussion was opened by Dr. A. J. Ochsner, Chicago, who was followed by Dr. A. B. Brumbaugh, Huntington, Pa.; Dr. E. S. McDonald, Cameron, Mo.; Dr. J. D. Milligan, Pittsburg; Dr. E. J. Waddey, Waterloo, Iowa; Dr. Sawyer and Dr. Ochshner closing the discussion.

The last three papers on the program were then read and discussed jointly: "Pelvic Injuries," by Dr. W. H. Condit, Minneapolis; "Injuries Involving the Rectum and Bladder, with report of a Case," by Dr. A. B. Bowen, Maquoketa, Iowa, and "Puncture of the Rectal Wall from Falling on the Handle of a Pitchfork, with report of a Case," by Dr. John H. Miller, Pana, Ill. Discussion of these papers was participated in by Drs. J. D. Seba, Bland, Mo.; S. C. Glidden, Danville, Ill.; K. W. Doege, Marshfield, Wis.; J. H. Stealy, Freeport, Ill.; A. G. Servoss, Havana, Ill.; S. Bell, Beloit, Wis.; A. E. Genter, Sheboygan, Wis.; I. K. Gardner, New Hampton, Iowa; and A. L. Wright, Carroll, Iowa; Drs. Bowen and Miller closing.

Paper passed at the afternoon session October 16th, entitled "Antiseptics: Their Use and Abuse," by Dr. C. E. Wright, Scales Mound, Ill., was read and discussed by Dr. O. B. Quinn, McComb, Miss., and Dr. L. W. Littig, Iowa City, Iowa; Dr. Wright closing. Adjourned.

OCTOBER 18TH, 10 A. M.

Meeting was called to order by Dr. Cavana in executive session.

Minutes of the last meeting were read and approved.

Moved and seconded that a list of the names and addresses of members of the Association, in pamphlet form, be published and distributed to the members. Carried.

The treasurer then submitted his annual report as follows:

TREASURER'S REPORT.

Herewith I submit to you an itemized statement of your treasury for the year ending September 15, 1907. Your treasurer, Dr. T. B. Lacey, recently deceased, asked me in January to relieve him of further responsibilities and duties in connection with his office. On the 21st of January I took charge of his books and accounts. The Executive Board at a called meeting directed me to act as treasurer until the annual meeting.

The following report covers all money collected and disbursed by Dr. Lacey and myself during the year.

Respectfully submitted,

H. B. JENNINGS,
Acting Treasurer.

SUMMARY.

Cash on hand last report	$1,170.71
Cash collected during the year	2,372.22
Total	$3,542.93
Total expenditure for year	2,413.62
Cash on hand Sept. 16, 1907	$1,129.31

MEMBERSHIP.

Executive members	164
Associate members	1,302
Unpaid dues Executive members	$225.00
Unpaid dues Associate members	511.50

Having been referred to the executive board to audit, Dr. A. L. Wright, chairman pro tem, said that the report had been audited, found correct and moved its adoption. Carried.

The executive board reported favorably upon the applications of Dr. J. H. Rishmiller, Dr. Frank E. Pierce, Dr. Archibald G. Thomson and Dr. Oscar LeSeure for Executive membership and upon motion carried they were unanimously elected.

There being no further buiness to be transacted in executive sesion society adjourned and immediately reconvened in general session.

GENERAL SESSION.

Minutes of the previous meeting read and approved.

At the suggestion of Dr. Brumbaugh, motion was made and seconded that no smoking be indulged in during the session. Carried.

The first paper on the program was then read, "Some Surgical Don'ts," by Dr. L. C. Henley, Chicago; this paper was discussed by Drs. J. L. Crook, Jackson, Tenn.; E. S. McDonald, Cameron, Mo.; W. H. Baldwin, Memphis, Tenn.; E. H. King, Muscatine, Iowa; E. J. Waddey, Waterloo, Iowa; H. B. Hemenway, Evanston, Ill.; S. H. Burnside, Wichita Falls, Tex.; D. W. Beattie, Neligh, Neb.; G. F. Beasley, Lafayette, Ind., and K. W. Doege, Marshfield, Wis.; Dr. Henley closing.

This was followed by the "Address," by invitation of Robert J. Cary, Esq., general counsel Chicago, Indiana & Southern Railway, Chicago, and passed at the first session. A unanimous vote of thanks was extended by the members of the Association to Mr. Carey for the address.

The paper entitled "Some Personal Experiences in 500 Cases of Fractures," by Dr. S. B. McLeod, Chicago, was then read and was discussed by Drs. W. Van Werden and J. D. Seba; Dr. McLeod closing.

Paper entitled "Treatment of Fracture of the Patella," by Dr. L. Sexton, New Orleans, was read by title.

The paper entitled, "Fracture of the Patella," by Dr. O. Fordyce, Guthrie Centre, Iowa, was read and discussed by Drs. G. W. Green, Chicago; I. K. Gardner, New Hampton, Iowa; W. Van Werden, Des Moines, Iowa; F. T. Fort, Louisville, Ky.; H. Philler, Waukesha, Wis., A. B. Brumbaugh, Huntington, Pa.; A. R. Mitchell, Lincoln, Neb., and closed by the essayist.

Secretary Jennings moved that immediately after adjournment the delegates of the different railroad systems caucus and select members of the nominating committee and report immediately after the beginning of the afternoon session. Motion seconded and carried. Adjourned.

OCTOBER 18TH, 2 P. M.

Meeting called to order by the President.

Upon motion made and seconded, the reading of the minutes was dispensed with.

The committee on necrology made the following report:

REPORT OF COMMITTEE ON NECROLOGY.

Since the last meeting of our Association there has entered our ranks that grim monster which levels to earth all classes of the human family regardless of rank, nobility, or station, and Death, like a passing cloud, has fallen softly and sweetly upon the following members of the Association:

Dr. R. H. Reed, Rock Springs, Wyo.; Dr. R. H. Sturgeon, Iron River, Mich.; Dr. H. E. Cushing, Champaign, Illinois; Dr. J. C. J. King, Waco, Texas; Dr. J. A. Smeallie, Cass Lake, Minn.; Dr. T. B. Jackson, Altamont, Mo.; Dr. J. S. Love, Springfield, Iowa; Dr. J. L. Warden, Pleasant Hill, Mo., and Dr. T. B. Lacey, Council Bluffs, Iowa.

Our beloved Treasurer, Dr. Thomas B. Lacey, in the midst of an active and useful life, was stricken with disease, and at last he realized that it was only a question of a few short months until he would be required to surrender back to his Maker the life which He had given him.

Very few members of this Association had the opportunity to know the many grand qualifica-

tions, the nobility of character, the purity of purpose and the lasting fellowship of a close knowledge and understanding of this man. His voice has forever been silenced; he is not here today; he is not dead, he simply sleepeth, and away out there, in that mysterious beyond, beckoning hands have signaled him to an eternal rest. Our brother and associate in this organization has passed from among us, but the good deeds he did, the excellent suggestions he made, the earnestness of his life, and his devotion as Treasurer of this Association, will live forever, and his memory we shall respect so long as our membership exists.

Dr. Lacy was the Treasurer of this Association from the time of its organization until he resigned, owing to ill health, shortly before his death, which resulted from syringomyelia, March 25, 1907.

He was an enthusiastic member of the Association, always greatly interested in all matters pertaining to its welfare and prosperity. He was for a number of years District Surgeon of the Illinois Central, and Local Surgeon for the Chicago & Northwestern and Wabash railways, and Professor of Surgery in Creighton Medical College of Omaha, Neb.

Dr. Thomas B. Lacey was born in Milford, Conn., in 1852. Received his literary education in Oberlin College, Oberlin, Ohio. He was graduated in medicine from the Chicago Medical College in 1875; practiced his profession one year at the Soldiers' Home in Milwaukee, and then located in Council Bluffs, where he practiced until forced to retire owing to ill health. He was universally respected and loved by all those who knew him and he will be greatly missed by the members of this Association.

It was moved and seconded that the report of the committee on necrology be accepted and spread on the minutes of the Association. Carried.

The following resolution was presented by Dr. Hugo Philler:

Resolved, That a committee be appointed to report at the next annual meeting as to the advisability of the members of the Association constituting themselves a protective society against unjust lawsuit for malpractice, a fee of one dollar to be assessed against each member, to be used in the defense of suits brought against members.

The resolution was referred to the judiciary committee.

It was moved and seconded that the Association proceed to the election of President. Carried.

Dr. A. I. Bouffleur: Mr. Chairman, I rise to place in nomination for the office of President a gentleman who stands at the head of the profession in his State, is a representative member of the profession of the whole country, and is one of our leading railway surgeons; a man who has attended every meeting of the American Association of Railway Surgeons. He has ever been held in high esteem and contributed much in the way of excellent papers and concrete valuable discussion, and in other ways contributed his full share to the success of our meetings. He is known to most of us, and I am sure that his name will appeal to you as a man who is well deserving of it, and, in fact, his nomination will be a greater credit to the Association than even it will be to him. I nominate Dr. A. L. Wright of Carroll, Iowa.

Dr. S. C. Plummer: I wish to add a word as to the faithfulness of Dr. Wright. The meetings of the Executive Board, of which Dr. Wright is a member, are held in Chicago, and Dr. Wright has been faithful in his attendance, although this meant making a trip from Central Iowa to Chicago. Dr. Wright has always taken great interest in the work of this Association; in fact, I do not believe we could pick out a member who has done more for the Association than has Dr. Wright. Therefore, I take pleasure in seconding the nomination.

Moved by Dr. Hugo Philler that the Secretary be instructed to cast the vote of the Association for Dr. Wright as President of the Association for the ensuing year. Seconded. Carried unanimously.

The Chairman: The Secretary is instructed to cast the vote of the American Association of Railway Surgeons for Dr. A. L. Wright as President for the ensuing year.

The vote is so cast by the Secretary.

Dr. Wright: Mr. Chairman and fellow members of the American Association of Railway Surgeons, I am too full for utterance. Those who know me best are aware that my forte is not speech-making. I wish to thank you most sincerely for the honor you have conferred upon me, and earnestly hope that I may merit the trust you repose in me. I again thank you.

The nominating committee's report was called for, and was as follows:

REPORT OF NOMINATING COMMITTEE.

Vice-Presidents, Dr. Frank T. Fort, Louisville, Ky.; Dr. T. W. Nuzum, Janesville, Wis.; Dr. L. A. Ensminger, Indianapolis, Ind.

Secretary and Treasurer, H. B. Jennings, Council Bluffs, Iowa.

Editor, Dr. Louis J. Mitchell, Chicago.

For filling the two vacancies on the Executive Board, Dr. A. I. Bouffleur, Chicago, and Dr. D. S. Fairchild, Clinton, Iowa, were recommended as successors to themselves.

The President-elect, being a member of the Executive Board, Dr. W. H. Bohart, Chicago, chief surgeon C. & E. I. R. R., was recommended to take his place on the Executive Board.

Dr. Wright tendered his resignation as member of the Executive Board. It was moved and seconded that his resignation be accepted. Carried.

Moved and seconded that the report of the nominating committee be accepted and that the above officers be duly declared elected for the ensuing year. Unanimously carried.

Motion was made by Dr. J. D. Seba and duly seconded that the portraits of the retiring President and of the new President and other officers of the Association be published from time to time in the Journal. Motion declared lost by President.

Upon motion made and seconded the executive session was declared closed and the Association immediately reconvened in general session.

GENERAL SESSION.

It was moved and seconded that the reading of the minutes be dispensed with. Carried.

The report of the special committee appointed to investigate the question as to whether the employment of trainmen has anything to do with the development of diabetes was then presented by the chairman of the committee, Dr. J. E. Owens.

Motion was made and seconded that the report of the committee be accepted and spread upon the minutes, that a vote of thanks be extended to the chairman and to the committee for doing the work connected with the report, and that the committee be discharged. Carried.

The first two papers on the program for the afternoon, viz.: "Diseases to Joints Following Injuries, Especially to the Knee and Hip," Dr. W. Woodbridge, Central City, Iowa, and "Dislocation of the Shoulder With Report of a Case," by Dr. I. D. Steffen, Antigo, Wis., were read and jointly discussed, those taking part in the discussion being Drs. J. D. Seba, Bland, Mo.; G. F. Beasley, Lafayette, Ind.; J. C. Dodds, Champaign, Ill.; D. W. Beattie, Neligh, Neb., Dr. Steffen closing the discussion.

Dr. A. R. Mitchell, Lincoln, Neb., then read a paper entitled, "Etiology of Lateral Curvature of the Spine."

A demonstration of the "Importance of Early Massage in Fractures Involving Joints" (by invitation) was made by Dr. Ferd. Engelbrectson, Chicago.

The last paper read was that by Dr. W. E. Gamble, Chicago, entitled, "The Treatment of Injuries of the Eye," presented by invitation.

The retiring President then addressed the meeting as follows:

Gentlemen of the American Association of Railway Surgeons: It is time to cease my labors as your President. Owing to the fact that during the past year I have been unfortunate in having a great deal of sickness at my home, and my time in consequence much occupied, I have not had opportunity to fulfill a number of the duties which come with the presidency of this Association in the manner so deeply desired by me. Nevertheless, I feel sure you all know that whatever omissions or mistakes I may have made during my administrative term were not intended. My whole heart has for a number of years been with this Association. I belonged to the old National Association of Railway Surgeons, and after the disruption, when the two branches of the organization separated as did the North and South, I stayed with the International Association because it was nearer to me at that time than any other organization of its kind.

And in reviewing the history of our Association, I am glad that, as has been done in the history of our land, we now know neither South

nor North nor East nor West—we are not now conscious of any division ever having existed in the Association.

While our Association has had its hardships, there must of necessity come a day, be it long or short, when the qualifications and achievements of its members as well as of the surgeons throughout the length and breadth of the land will at least be given greater recognition and appreciation by the railroads whom they benefit. I know that, as was suggested by the learned attorney who spoke to us, there will come a time when there will be a closer association between the departments of law and of surgery and the management of the road. We clearly recognize that the railway surgeon has no authority whatever to interfere with—or suggest to the management of any department outside that of the surgical department. And the surgeons today who represent the railroad companies do so with a pride in their professional ability and in an effort to do their part when called upon to treat the unfortunate with whom they come in contact and to send their patients away in a condition as near to perfect restoration as is possible for science to do.

In conclusion, allow me to say that in severing my connection with you as your presiding officer, I will bear away with me to my home the most kindly feelings of gratitude towards you as members of this Association, for the confidence resposed in me in electing me President of this organization for the year just closed. I would like to see this organization grow and grow and grow, until finally its magnitude can only be measured by the superiority of its manhood and the excellency of its work.

I will ask that the newly-elected President be escorted to his position as President of this Association.

Dr. E. S. McDonald: Gentlemen, members of the American Association of Railway Surgeons, I have the pleasure of introducing to you President A. L. Wright, who is intellectually and educationally equipped to discharge the duties of this office with dignity and honor.

President Wright: I wish to thank you most heartily for the confidence you have reposed in selecting me as presiding officer for the ensuing year. I hope you will be patient with me, and if any errors are committed know that they are not of the heart, but of judgment.

President Wright took the chair.

Dr. Louis J. Mitchell moved that a vote of thanks be tendered the retiring President for the urbanity, diligence and faithfulness with which he has administered the affairs of the Association for the past year. Motion duly seconded. Carried unanimously.

It was moved and seconded that a vote of thanks be also tendered the management of the Palmer House for again granting use of the room in which the sessions have been held, free of charge. Motion unanimously carried.

Upon motion made and seconded the meeting adjourned subject to the call of the Executive Board. H. B. JENNINGS, Secretary.

REPORT OF THE COMMITTEE ON DIABETES.

The committee appointed to inquire into the extent to which, on account of their occupation, trainmen, and particularly enginemen and firemen, are subject to diabetes, begs leave to submit the following report:

Perhaps the most interesting result of our inquiry is contained in the report of M. Navarre of Lyons, France, who, in 1905, stated that during the previous ten years the Paris-Mediterranean railway had on its rolls 62,200 employes. Of these, 53,500, the stationary class, were trackmen and station hands, and 8,700 the traveling class or trainmen. Of the latter, 4,590 were engineers and firemen and 4,110 were conductors and guards (or, as we call them, flagmen and brakemen). During the period mentioned there was reported 110 deaths from cases of diabetes among the stationary class, and 112 among the trainmen, divided as follows: 58 among the enginemen and firemen and 54 among other trainmen. From an analysis of these figures it is seen that the mortality was about 3 per thousand for all employes; but for engineers and firemen it was 13.63 per thousand and for other trainmen 13.16 per thousand, and only 2.56 per thousand of those employed in the stationary department, i. e., section laborers, trackmen and station men. During the same period of 10 years, among 723 employes retired for chronic disease, 14 were re-

tired for diabetes; 11 of these were engineers and firemen, and 3 of the stationary class.

It was M. Navarre's opinion that the engineers and firemen, as a rule, living largely in the open air, possess a keen appetite and are great eaters, and have arthritic diathesis, particularly when nearing the age of 40. He thinks these conditions probably are the causes of the high percentage of the cases of diabetes among firemen and engineers. At the same time, it will be noticed that this percentage among conductors, guards, etc., men of different statures and temperament, is even higher than that of engineers and firemen. However, he states that when we regard the incomplete data so far obtained on this subject, it is clear no definite conclusion can be safely reached.

From an inspection of the files of the Pension Department of the Illinois Central Railroad Company, it was found that 18 men were retired for disabilities. Of these, 7 were engineers and 4 were firemen. In the physical examination of these men preliminary to their retirement, by urinalysis no sugar was found. The files did not show urinalyses to have been made in the other 7 cases.

An examination of the files of the Pension Department of the Chicago & Northwestern Railway Company showed 37 retirements. Of these, 27 were engineers, and 1 fireman. In none of these cases was sugar shown, although the specific gravity in the urinalyses of 3 engineers was high; in one case, 1.032, with much bile in the urine; in another, 1.030, and 1.025 in the other. Except 2, none of the 37 who were pensioned was under 60 years of age.

Dr. Latta, the Chief Medical Examiner of the Pennsylvania Railroad Volunteer Relief department, stated that the Pennsylvania company does not insist upon a physical examination of enginemen or firemen preparatory to promotion. He shows that at the rate of 100,000 per annum the number of trainmen disabled on account of diabetes was 82. Of these, 19 died. Forty-seven of these disabilities were among conductors and brakemen, with 13 deaths. There were only 6 deaths in the 35 cases among enginemen and firemen.

Dr. S. R. Miller, Surgeon of the Southern Railway and L. & N. R. R. Company, stated that he could recall only 54 engineers and firemen whom he had examined for sugar, and these examinations were in connection with an operation or for insurance. None of these were diabetic, except 1 fireman who developed diabetes following a severe case of smallpox.

Mr. S. R. Barr, Superintendent of the Relief Department of the B. & O. R. R. Company, reported that during the fiscal year ending June 30, 1907, of 375 deaths occurring among employes, 90, or 24 per cent, were from natural causes. Of these, 3 died from diabetes. Of the trainmen dying from diabetes, two were conductors and one an engineman, or nearly 3 per cent.

Dr. J. P. Kaster, Chief Surgeon of the A., T. & S. F. Hospital Association, gives the statement that during the past three years there has not been an engineman in whose case diabetes was recognized, nor did trainmen in any of the hospitals furnish a case of diabetes, although urinalysis was one of the first acts taken upon his entry.

Dr. A. F. Jonas, Chief Surgeon of the Union Pacific Railway Company, has the impression that railroad men seem less liable to diabetes than other men.

From the O. R. & N. Navigation Company comes the report that its list of pensioners was small and up to the present time no cases of diabetes were recorded. It was found that in 20 years only three or four cases occurred among trainmen. It was not thought the occupation of the men had anything to do with the disease. It was further stated that the number of train and enginemen who have been pensioned was 13; none of these on account of diabetes, and none has died from that disease.

Dr. Knox, Chief Surgeon of the Sunset Route, reports that his hospital files do not reveal a single case of diabetes among engineers and firemen.

The Galveston, Harrisburg & San Antonio Railroad Company does not show that any trainmen or enginemen were on the pensioned or retired list for diabetes.

Mr. Warren S. Stone, Grand Chief of the Brotherhood of Locomotive Engineers and Firemen, kindly furnrished us with tables, from which we extract the following: The whole

number of deaths or disabilities under the caption, "Cause of Death or Disability," was 740; the number of deaths from diabetes was 7, or a trifle less than 1 per cent. The ages at death of the men ranged from 35 to 69. The length of time the number was employed varied from 2 to 18 years.

Dr. William B. Cory, Grand Medical Examiner for the Brotherhood of Locomotive Enginemen and Firemen, reported that only in the third decade of the life of that organization had any reports been kept, i. e., from July 1, 1894, to October 1, 1907, but the figures he gave were brought down only to August 1, 1907. In their records he finds 26 cases of death from diabetes in a total of 2,079 deaths. This shows a trifle more than 1 per cent.

There is a dearth of information in the pension files of the twenty railroads that have adopted the pension system, nor could this be otherwise, since the existence of these pension systems has been comparatively short.

This sums up the result of the numerous efforts made towards obtaining sufficient information to answer the inquiry that devolved upon this committee, a result not entirely satisfactory. This information was sought from various and varied sources, but from the failure to keep records or by the absence of investigation into the causes of disability and death among trainmen, we were able barely to obtain enough facts to warrant the arrival at a conclusion, or possibly to draw an inference.

We can, however, deduce from the data we did obtain that the percentage of deaths by diabetes of the deaths from natural causes among trainmen is about 1 per cent, and that the occupation of the employe does not enter as a factor in increasing or diminishing this percentage.

It does not appear that the number of deaths due to diabetes amongst males is much in excess of that from the same cause amongst females.

According to the last census report, in the registration area the number of deaths reported as due to diabetes, during the last census year, was 2,693, of which 1,404 were males and 1,289 were females.

Moreover, the statistics show, for the registration States, that the death rate from diabetes was slightly higher in the rural districts than in the cities, and was highest of all among females in the rural disticts of Vermont.

Again, during the last census year the death rates from diabetes in each of two age groups per 100,000 population, by sex, is reported to have been, males, 5.5; females, 3.7, from 15 to 44 years of age; and males, 31.9; females, 32.8, from 45 years and upwards.

JNO. E. OWENS, Chicago, Chairman;
E. W. SPOTTSWOOD, Missoula, Mont.;
A. F. JONAS, Omaha, Neb.;
J. P. KASTER, Topeka, Kan.;
S. R. MILLER, Knoxville, Tenn.

A LANTERN FOR DETECTION OF COLOR BLINDNESS. LANTERN NO. 2.*

ARCHIBALD G. THOMSON, M. D., PHILADELPHIA.
Ophthalmic Surgeon, Pennsylvania Railroad.

In 1901, Dr. William Thomson and myself presented, at the meeting of the American Ophthalmological Society, a lantern for the detection of color-blindness, to be used in conjunction with the wool tests already in use on the railroads.

Having in mind that the examinations should be as practical as possible where large numbers of men are required to be examined and appreciating that the ordinary wool tests that have been in use for many years did not meet all the requirements and would not detect all cases, that therefore some other means of examination should be added to those now in use to make our system complete.

The wool test has never been popular with the men, as they do not understand it and continually complain that they are not required to see so many colors, and also when this test is used by inexperienced examiners, there is the chance of the patient being rejected on account of color ignorance when his color defect is normal.

This lantern has been in use since 1903 on the Pennsylvania Railroad and has showed its

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

superiority over the wool test by detecting more promptly and with greater accuracy the different forms of color-blindness, and at the same time giving greater satisfaction to the men; but although giving satisfaction, our experience has shown us that it is not in the high state of perfection that we should desire, owing to the fact that during the past few years the shades of colors used in signals have been somewhat changed, by a gradual process of evolution in determining the best shades for practical purposes. The addition of the yellow light, which will eventually be used for signal purposes, and the important fact of presenting the color at the opening properly illuminated with its full saturation, and at the same time maintaining the opening of the lantern uniform in size. These modifications added to our previous lantern which I present today, overcome these difficulties and make it a most scientific and valuable means of detecting any form of color-blindness.

The object of this lantern is to be as practical as possible, and to be used by lay examiners with a surety of detecting any form of color-blindness. At the same time the colors which have been carefully selected, from a scientific standpoint, each meaning something when thoroughly understood, make it a very valuable scientific instrument in the hands of an expert.

The lantern consists of an asbestos chimney which can be placed on a kerosene lamp in universal use on railroads, or over an Argand burner or other gas light, electric lamp or spring candle stick. In this form it is sent from the manufacturer, giving ample illumination and making it economical and always ready for use.

There are two discs 3½ inches in diameter, each containing seven openings which carry the colors, which revolve over each other so the colors may be seen separately through the opening at which they are presented, or be superimposed.

The openings in the discs where the colors are shown are ½ inch and 1-12 inch in diameter, and are made of the size to simulate signals at different distances. Taking Donders' formula for measurement of color perception, the small opening of 1-12 inch, when placed in front of a color, is equal to normal color vision at 32 feet. The ½ inch opening is equal to normal vision at 200 feet and for practical purposes the ½ inch opening at 20 feet is equal to the ordinary 5 inch semaphore light at one-half mile.

The lower disc contains the standard colors used as signals on the railroads: red, blue-green, blue of the inspector's light, and yellow (this color, I think, will eventually be adopted by the railroad as one of its standard colors. This disc is known as the examination in chief).

The colors have been carefully selected and are identical with the standards used on the railroad when shown in the lantern. These colors are designated by numbers, 1 to 7.

The upper disc contains the confusion colors, and the small opening of 1-12 inch which is used as a quantitative measure of color perception. This is known as the cross-examination and its colors are designated by letters of the alphabet—A, B, C, etc.

The colors of this disc are pink, yellow-green, cobalt, deep London smoke and gray ground glass. This part of the lantern I do not think is thoroughly appreciated by the profession, and yet it is the most important in detecting the different types of color-blindness, and especially those varieties that are not perfectly determined by the wool test. For example, the three colors, pink, yellow-green and gray-ground glass are the typical neutral colors of the color-blind and represent the confusion colors of the wool test. The pink, which to the normal eye appears light red, is composed by the spectroscope of pure red and blue. This cannot be imitated in glass, so it is made of a piece of colored gelatin and placed between two layers of glass. If this color is regarded through a piece of peacock-blue glass, cutting off the red it appears blue. The normal eye sees it as light red, the red-blind man, having his red sensation defective, sees only the blue and as these three colors, pink, yellow-green and gray are the color-blind man's white, so the pink may be mistaken for white; the same holds good with yellow-green or gray-ground glass, which may be mistaken for white, red or green. You will find in the practical ex-

amination of one who has a defect in his color sensation that these three colors are invariably designated as the same color, the only distinction he makes is that they are different shades of the same color, while to the normal eye they are three distinct colors.

The London smoke is used to reduce the intensity of the color and for practical purposes simulates the changes that take place in the atmosphere, rain, fog, etc. The cobalt transmits both red and blue and is also a good test and at the same time when used with other colors, makes valuable combinations.

By being able to superimpose the colors one over the other we are able to get not only a considerable variety of different colors, but many shades of the same color, for example, we have seven shades of red, ranging from an exceedingly dark red color that might be represented by a lamp burning very low, up to a very light pink. These can all be shown in rapid succession.

One of the great difficulties we experienced with our previous lantern and in fact which all other lanterns are subject to, is to procure proper illumination at the opening, whereby the color when presented would appear in its full saturation and intensity, and at the same time maintain the opening of proper size and uniformly illuminated. These difficulties we are now able to overcome by the use of a corrugated lens placed in the lantern and through which the light passes before emerging through the colored glass.

In the old lantern we used a naked flame, candle, gas, or electric light immediately back of the colored glass shown at the opening. If the naked flame is shown through the large opening, and viewed by the one examined in such a position that he will see the flame through the colored glass, the intensity of the color at this point will be greatly reduced or washed out by the yellow flame or vice versa that portion of the opening not sufficiently illuminated will be correspondingly reduced in intensity. And as these openings are made of such a size to represent signal lights at different distances if illuminated this way, the proper ratio of distance and size is not carried out.

The size of the opening can be made uniform by the superimposing of ground glass in front of the color, but in doing so the intensity and saturation of the color is reduced.

The addition of the corrugated lens in the present lantern is of great improvement. It overcomes the former difficulties by giving a uniform opening and at the same time does not reduce the intensity and saturation of the color, and secondly the corrugations of the glass being very small, is practically a miniature semaphore light, and acts precisely the same at the distance we use it, as the railroad semaphore.

The lantern is made, as I have stated previously on very practical and economical lines and is sent from the manufacturer in the present form as you see it with the spring candlestick and candle, producing the illumination, this giving ample light to make all the tests with promptness and accuracy. The spring candlestick heretofore has had its disadvantages, as unless it is made carefully the candle will not be kept forced up to the correct position. This was one of the objections to our old lantern, especially so when we depended on the naked flame immediately back of the colored glass; so if the candle was not forced up into correct position, the illumination was not sufficient and the intensity of the color reduced. Now the candlesticks are made with great care, of highly polished brass tube instead of cast iron, and so far have worked to the greatest satisfaction; and if by chance the candle does not work properly our test is in no way impaired as heretofore, as by the use of the corrugated lens even if the candle is not in perfect position the opening will always be uniform and sufficiently illuminated. The candle is the most practical and portable means for illumination, yet if any large number of cases are to be examined, any other of the permanent means which have been suggested for illumination can be used.

In the lantern only one color at a time is presented for examination, and in this it differs from some other lanterns which are now in use. As to the value of the single or double opening there is a difference of opinion as to which gives the best results. We have always held that the single one was the best, as the person with a defective color sensation always dis-

tinguishes the color (not by the color, as he does not see it) but by the intensity and brightness, and by having two lights shown at the same time, he is able to make a comparison, and having one of the different forms of color-blindness in which he was able to recognize slightly one of the colors, he could then guess correctly as to the other color, having it to compare with the one he recognized. It used to be quite common to find men who have been

Thomson's Lantern, Model No. 2.

on the road for a long time, running their engines successfully and claiming never to have had an accident, yet were undoubtedly color-blind. The success of these men in their running was evidently due to the fact that they knew the position of the signals, and seeing the two signals, could contrast them, whereas I am confident that if, through some accident, one of the lights should have gone out, the men would have found themselves greatly at a loss to know how to act under the circumstances.

In this lantern, by being able to superimpose the colors, we can show many shades of the same color in rapid succession, which to my mind is a more valuable test than two colors or shades of the same color presented at the same time.

I have recently had occasion to request examiners of the different divisions of the Pennsylvania Railroad to report to me as to their experience with the lantern, and as to its efficiency in comparison with the wool test. In every case they were enthusiastic as to the use of the lantern, considering it far superior to the wool test as a means of examination; and also as regards the satisfaction it produced in the employes that were examined. Regarding its use in my own hands, I have met with the same result.

Several instances in which men have been referred to me who only have been slightly defective in color sensation, or at the same time having been coached as to the examination with the wool tests, in which they made very few, if any mistakes, have utterly failed on the lantern test. In my experience there are certain forms of color-blindness where the lantern is the only absolutely reliable means of detecting the defect; an example, scotomas from tobacco and alcohol and the green-red variety of color-blindness. Which should make its use absolutely essential to all railroads in testing for color-blindness in its employes.

DISCUSSION.

Dr. A. H. Andrews, Chicago: I have been interested in this lantern for a number of years, and am pleased to see the improvements that have been made in it recently.

I will not enumerate them, but the principal one is the placing of a corrugated glass back of the colors in order to diffuse the light. In some of my own experimenting I have tested not only for the patient's ability to detect colors, but the rapidity with which he detected them, and in so doing I have placed a photographic shutter in front of the light, a shutter in which the aperture could be adjusted and the time could also be adjusted. I have used one second, ½ second, 1-5 second, 1-25 second, and 1-100 second. I have found a number of applicants who could tell a color if they were given plenty of time, but who upon the spur of the moment could not tell the color.

I am inclined to think, however, that for

practical purposes and in the hands of the ordinary examiner a man who has not made a study of color perception, the worsted test is a most excellent one when it is properly applied. I know that the men do not like the test very well, but we do not like a great many things that are good for us, and I am a firm believer in the worsted test. I think that the manner in which it is presented to the men has a great deal to do with the way they look upon it and with the results that we get from examination with the worsteds. I am in the habit of placing the worsteds before the man who is being examined and asking him to pick out all of a certain color there are, regardless of the different shades, all that have any of that color in them, and I sometimes tell him about the number he ought to find. I am not averse to asking the employe to name the colors, because I think any man who does not know the colors used most—green and blue and the primary colors—by name, is not fit to run an engine.

So far as coaching is concerned, I have known of that being attempted a number of times, and I never have known it to do one particle of good to a man who was even slightly defective in color perception.

Dr. O. B. Quinn, Macomb, Miss.: This has been a most interesting paper. I want to ask Dr. Thomson whether or not in his opinion the examining surgeon should name the colors from time to time. I have been in the habit of using the worsted test quite a number of years, and in cases where we detect defective color perception by this means, although the defect might be brought out more fully by the lantern test, I believe that the applicant should be rejected as color blind.

Dr. J. E. Owens, Chicago: The discussion brings up rather an interesting point, namely: Are we in a position to discontinue asking applicants for service the names of the colors?

I presume Holmgren's book is the most valuable treatise on color-blindness that has yet come to this country, and he very forcibly instructs us not to ask applicants the name of a color; that those with defective color sense get an idea of color not in the way that the man with normal perception gets it, but from the intensity of the color, which must vary on trains, say during the day, as to whether the engineer is running a deep cut, in the shadow of a wood, or in the ever-varying lights and shades of cloudy and cloudless skies. Both for the Northwestern and the Illinois Central companies we have used the worsteds, and still continue to do so. It is economical so far as expenditure of time is concerned, but, as the author of the paper states, it does not appeal to the men. They think there is something tricky about it, something that is too scientific for the railroad man to appreciate. But we have the Williams lantern (we have not the good fortune to possess the one presented here, which is doubtless an excellent one), and occasionally, just by way of comparison, we use the Williams lantern after a man has been found with defective color sense. In all cases they make the mistakes we expect them to make and which they made with the worsteds.

In one part of the report formulated and sent forth by the Committee on Safety Appliances, which has its meetings in various parts of the country, and which committee considered this same subject for two or three or four years, if I remember correctly, it is stated that we must not ask applicants the names of the colors for the reason already set forth, while in another part of the report where the use of lanterns is considered we are advised to ask applicants the names of the colors. I would like to hear from Dr. Thomson in his closing remarks as to what he thinks about the advisability of discontinuing this practice, namely, asking the applicant to name the colors.

I will go a little further than the gentleman who spoke just before me. Once in a while a grievance committee brings a man in and says his color is all right and would like him passed. In such cases I have said: "Before you judge of this matter let us examine your own eyes." That gives the members a little shock, but still they are examined and pass all right. Then I say: "Take your friend and have him do as you do." He makes the characteristic mistakes and that seems to close the matter for the time being. We moreover do this: Allow the man to pick the colors out as slowly as he

desires, and if he is lame and uncertain and consumes a lot of time we pick them out for him and then tell him to go on; but if he has defective color sense, he does not do it.

There is another point which has interested me much in my own examinations, namely: A man comes to us with defective color sense and we record the mistakes. He comes in again and says: "I would like to have another examination; will you give it?" "Yes." And so just to please a man I have examined him several times during a period of three months, and eventually he showed the same characteristic mistakes. But the point is that after a man has had a number of examinations, proving himself characteristically color blind in the first, after he has practiced at home amongst the women with their different colored ribbons and fabrics, in the paint shop among the painters, etc., he comes back for another examination and squeezes through. Shall we accept that man, qualifying him on that last examination, or reject him on account of the previous one? I would like to hear what Dr. Thomson would say in regard to his experience with such men. I presume he has found the same conditions.

Dr. Thomson (closing): I did not mean in my paper to give the impression that the wool test should be displaced by the use of the lantern, but that we should have, besides the wool test, a lantern to use in conjunction with it. I think the wool test the most valuable and pracical way of making examination for service on the railroad. There is no better way nor no surer or quicker way of doing it, and it will detect almost every case of color blindness, the only exception being the two slight defects mentioned in my paper, and it is because of these that I have shown you this lantern. Sometimes he will almost pass the wool test, yet when you put that man up to a lantern he cannot call the color—he mistakes the white, red and green, they are all one color. The point I wished to make in my paper was that in our examinations, in order to be as safe as possible, not only should the wool test be used, but the lantern test should be used in conjunction with it. That is, the wool test first, and if a satisafctory examination is made, all right; if not, if he shows the slightest defect, then I would suggest the use of the lantern as well. I did not mean to discard the wool test, because this is too useful to be done away with.

As regards the naming of the colors. At first, of course, have the man pick out the colors of the wool and where there are a large number of shades I do not think it right to ask the man to name the colors, because immediately he becomes confused and cannot do it, therefore I never ask him to name them. But after a man has been examined by the wool test and is being examined by the lantern I ask him either to name the colors as he sees them, or if he seems to fail in that, to say as I put the colors up, what he would do under those conditions—whether it is a danger or a safety signal, and let him call off what he would do. I think that is even more valuable as a test than to ask the man to pick out the colors, because it is practical—those are the conditions the train-man runs up against every day. He may have fog, the light may go down, certain conditions of the atmosphere may arise which change the degree of saturation and the colors seem to vary in their appearance. As stated, in examining with the lamp I do one of those two things—ask the color first, and if he seems confused simply put the color up and ask him how he would act under those conditions.

So I would not abolish the wool tests, I think them most valuable, but I think there should be something added to these. Therefore, as suggested in my paper, we ought to have a lantern.

In regard to the question of coaching a man, I have seen cases where a man would be found slightly defective, but after being examined several times and perhaps coached, he would with the wool test be able to pass the examination. Therefore, it is my opinion that in those cases a lantern should be used, when they will surely fail; at least I have never seen one case yet that has not.

Flying, so-called neuralgic pains in the head, *when they attack both sides and do not map out the district of one or the other branches of the fifth nerve,* should lead to attentive examination for symptoms of tabes.—*Buzzard.*

OBSERVATIONS IN THE TREATMENT OF 5,000 INJURED RAILWAY EMPLOYES AND PASSENGERS, WITHOUT A CASE OF TETANUS, AND BUT ONE OF DELIRIUM TREMENS.*

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TETANUS.

When called in to attend an injured person, if the skin is abraded, be it in railway or private practice, our first inquiry is to find out the relative danger of infection, keeping ever uppermost in our minds that most of all dreaded infection—tetanus. Our first question should be when, how and where was the injury received, and what has been applied to the injured part.

In asking the question, when was the injury received, our object is to form an opinion as to the length of time an infecting agent has had time to develop. How was the injury received? This is the important question. Take for an example, a nail puncture. The first question is, what was the nail in? If the nail was in a loose board, was that board in, or had it been a part of a walk? Was the board on the ground, where the soil was loam, sand, cinders, or were there fertilizing agents from the barn, cars, or pens used for animals? The same would apply if it occurred in private practice, around the homestead and barns on the farm.

We crave your indulgence for a few moments, while we discuss the infecting agents found present in infected wounds. The first to be discussed and the most dreaded, but least often present, the bacillus of tetanus. This sporogenic bacillus is identified and is cultivated by experimental demonstration. Abundant evidence shows it inhabits the superficial layers of the soil, it is found most abundant in garden soil.

The reason for this is, the sporogenic bacillus is found *most* often in loams and barn manure, less often in sand. It is sometimes found on the hands of those who till or handle the soil. It is said they can retain their vitality for months in a dried condition. It is also said to be extremely difficult to isolate and cultivate, because it will not grow when the smallest amount of oxygen is present.

Access to the human organism is gained almost exclusively through a wounded surface. Doubtless most examples of the so-called "idiopathic" or "rheumatic" forms of tetanus depend upon the infection of minute and hidden, or healed wounds.

Possibly the sting of certain insects may be instrumental in carrying the infectious material. It is not improbable that flies and mosquitoes act as such carriers. The tetanus bacillus must penetrate the tissues deeply before it can exert its specific pathogenic action. This explains why tetanus is met with so often in punctured-contused wounds.

It occurs more often in hot climates and in those persons of dark skins, negroes, Italians, Hindus, etc. Appreciating the indifference with which this class treat minor injuries and their proverbial uncleanliness, we can well understand their greater liability to infection. The mortality among colored infants is high in comparison with the white race. One explanation is, greater risks of infection through the cord of the new-born, cut as it is with dirty scissors, handled with dirtier hands, and wrapped in unclean rags. A large per cent of colored infants on Southern plantations die from trismus neonatorum, within a fortnight after birth.

The eleventh census report shows "2,019 deaths from tetanus. Persons from 5 to 15 years old show the highest death rate, 1 to 74."

During the Civil War, 2 in each 1,000 injured, tetanus followed. Prevention of wound infection constitutes the most important part of the modern practice of surgery. To secure an aseptic condition of the wound, and of every-

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thing which is brought in contact with it, and to keep it so, must be our highest aim.

Elaborate operating rooms are desirable, but not essential to obtain aseptic results. If we follow this rule to the letter, make and keep the wound aseptic, make and keep yourself aseptic, make and keep everybody and everything that comes in contact with the wound aseptic, ideal aseptic results can be obtained in a very large per cent of cases.

A surgeon who does a large amount of emergency surgery must not expect as low a per cent of infection as his confrere, who does only planned surgery.

We have abandoned infiltration methods of anesthesia, in emergency cases. The per cent of infection is too great. The chief reason is, the injured part cannot be as asceptically prepared. Take crushed fingers or toes as an example. First we scrub the hand and fingers, or the foot and toes, then we infiltrate close to—or at a distance from the crushed tissue. As soon as anesthesia is complete, we commence to scrub the injured tissue with soap and water, using a brush or gauze sponge; when we have scrubbed the raw tissue about twenty seconds the patient insists it hurts; we infiltrate again and continue the scrubbing process. The patient insists it hurts him more than he can bear. As a rule you stop at this stage, and trim up the stumps and coapt the flaps, or if you now give him a general anesthetic and aseptically prepare the part, aseptic healing is the result.

You cannot too thoroughly emphasize the importance of thoroughly scrubbing crushed tissue with a brush and green soap or gauze, especially crushed fingers, toes, hands or feet. Five minutes spent scrubbing fingers or toes is time well spent.

The tetanus germ must penetrate deeply to develop; it must get beyond the possibility of contact with oxygen; for this reason, we must penetrate to the bottom of all cavities or pockets in our aseptic preparation of crushed tissues, contused, lacerated or punctured wounds.

Nail punctures in the plantar surface of the feet are the best example of deep penetrating wounds, that exclude oxygen. Danger of tetanus is very great, as the nail that has penetrated the foot is most often in a board that has been in contact with ground, the home of our most dreaded enemy, the tetanus spore.

The horny layer of the skin on the plantar surface of the foot closes with a valve-like action, after the nail is withdrawn, and shuts in the infecting agent that was in contact with the nail.

As a rule, aseptic results hinge on the first dressing. So the first question was: What has been applied to the wound? If the patient has used domestic remedies only, sueh as vaseline, lard, butter, tallow, a piece of bacon or pork, or some ointment that happens to be the favorite of the household, the infection will be staphylococcus in 80 per cent of cases. Among laborers and railway employes a chew of tobacco generously donated by a fellow workman is the remedy par excellence. I am thankful I do not meet with this domestic emergency treatment as often as I did a few years ago. Staphylococcic infection is to expected. I have never known syphilitic infection to result from the application of a chew of tobacco to a wound, though I see no valid reason why such infection might not occur.

First aid lectures to railroad employes, and first aid packages at every station, shop, roundhouse, and on every engine or cab, where they can be utilized, ought to greatly lessen our mortality, and do much to prevent wound infection.

TREATMENT OF NAIL PUNCTURES.

We prepare the part as carefully as we do for any emergency operation. Nail punctures are found in the bottom of the feet in 80 per cent of cases, so in outlining our treatment we will suppose it is a nail puncture of the plantar surface of the foot. We first trim away all the calloused skin for ¼ inch around the point where the nail entered, using a pair of manicure scissors, curved on the flat. These have very fine points and cut away the calloused skin easily. The next step is to disinfect the puncture; 98 per cent carbolic acid is used on a very fine nasal probe, or a small round wooden toothpick. A very small quantity of cotton is twisted on the probe, immersed in the acid and carried by a rotary motion to the bottom of the wound several times. The same procedure is

now carried out with alcohol, to neutralize the acid.

A small wick of gutta percha tissue is carried to the bottom of the wound, and a moist dressing applied, covered with gutta percha tissue, and held in place with adhesive straps; a few turns of a roller bandage is applied over all; this dressing allows the laborer to put on his shoes and return home or to his work. This treatment enlarges the wound, destroys any spore that may have been carried into the tissues and left there by the nail.

In the treatment of 200 nail punctures of the feet, hands or other parts of the body, I have never enlarged the puncture by an incision.

The only nail punctures that have been infected are where the laborer has gone home and applied some domestic remedy before he came under our care. A large per cent of these cases have been treated at our emergency office, near where the railroad tracks were being elevated. The laboring men are Poles, Italians, and Lithuanians.

We have had an average disability of three days. The longest disability was 30 days, on account of an infection, caused by a nail scratch on the arm. This patient came to us five days after the accident, with a badly infected arm; hot boric dressings were applied to reduce the inflammation, after thoroughly draining and cleaning the wound. He returned to work at the end of fifteen days.

Another patient was off duty fifteen days from multiple abscess, due to infection from a nail puncture of the hand, but he did not report to us until after infection had taken place. Several nails passed through the hand and quite a number passed through the fingers. Among nail punctures outside of those in the hands and feet, were nail punctures of the cheek, lip and head.

LACERATED, INCISED AND CONTUSED WOUNDS

We have treated about 3,000 cases of this class. We first scrub the part with soap and water, using the brush whenever possible, then using gauze or cotton balls to scrub the edges of the wound itself, always keeping a piece of cotton or gauze pressed firmly into, or held on, the wound, to keep out the dirty suds. The wound is now rinsed with sterile water, and a liberal quantity of hydrogen peroxid used, which is flushed away with sterile water, or salt solution.

When a lacerated or incised wound is deep, the patient is put to sleep so we may be able to treat the wound more energetically, and to carbolize the deepest pockets, using 98 per cent carbolic acid.

As a rule, some form of wet dressing is used and held in place with strips of adhesive plaster. This is especially used on the arms, legs or body, where it is difficult to keep a bandage in place. Near the wrist or ankle, a spiral or figure-of-eight bandage is also used in addition to the adhesive strapping.

You are all aware how difficult a task it is to aseptically prepare the foot, or that portion of it occupied by the toes.

We can only hope to make a relatively sterile field. To accomplish this, we take strips of gauze, soak them in green soap, insert them between the toes, and with a to-and-fro motion remove the accumulated filth.

In dressing lacerated and incised wounds of the fingers and toes, the wound is first made aseptic, then covered with a slight dressing of aristol or compound alum powder; over this, three or four turns of a ½-inch gauze spica bandage is applied.

Now, the final step is the important one, for when the dressing is complete, the toe or finger is in an adhesive plaster cast, practically impervious to water or outside infecting agents. Cut adhesive plaster into strips ½-inch wide and 3 to 5 inches long; encircle the finger or toe, cover the dressing with these strips, the upper or lower edge of the plaster passing ½ inch above or below the gauze bandage previously applied, or covering in the end of the finger or toe, allowing the strips of plaster to overlap one-half their width. Allowing the plaster to pass above or below the bandage or gauze, prevents any leakage through the gauze to take place. The wound is practically sealed.

The swelling that takes place is only a trifle, because of the firm support given by the adhesive plaster cast. The patient never removes this cast; they often do ordinary gauze dress-

ings. The patient can wash his hands and not soil the wound. The period of disablement is very short, about one-half as long as when ordinary gauze dressings are used.

We remove the cast about every second or third day, cleanse the wound and apply a new cast.

It must be understood that the greater proportion of the 3,000 cases of contused, lacerated and incised wounds were small wounds of the skin, received by the men in various ways, while about their work as switchmen, firemen, engineers, section men, and laborers employed in track elevation work. The railway companies I represent employed for five years from 500 to 1,800 men, four to seven months of the year, and handled from 250,000 to 1,000,000 yards of sand, besides building some 20 miles of retaining walls.

CRUSHING INJURIES AND AMPUTATIONS.

Shock, as a rule, increases in direct ratio as the line of injury passes above the knees, although I have never saved a person with *both feet* alone crushed. I think it a poor rule to amputate in shock; one or even two hours spent in restoring the patient and relieving pain works wonders. In nearly all crushing injuries of the arm or leg, I first find and ligate all large vesels, as high as possible; then, using a strong, sharp pair of scissors, I amputate through the crushed tissue, then ligate all small vessels that show evidence of hemorrhage.

The nerves are carefully isolated and injected with cocain or salt solution before they are severed. I now pack gauze or cotton among the crushed muscles, and bind up the stump or stumps, if operation is deferred. (In the meantime an assistant or nurse has properly scrubbed the part or parts above the injury.)

This method, properly applied, controls nearly all hemorrhage. It goes without saying that the tourniquet is removed, as its continued application causes embolism, and devitalizes what is already tissue of the low-resisting power.

Whenever possible I form a musculo-cutaneous flap, as it has greater vitality and there is less liability of its retracting or sloughing. I have never seen a musculo-cutaneous flap slough, but I *have* seen a great many cutaneous flaps slough.

I have been obliged to operate but once for neuromas following amputation. Twice I have found it necessary to shorten the humerus and femur after amputation, because of contraction of the muscles. In both cases it was because the stumps became infected. Skin grafting stumps where sloughing or retraction of flaps has taken place has not been satisfactory. I have used both pin and Thiersch grafts.

SYNCHRONOUS AMPUTATIONS.

I do not believe in synchronous amputations, not even of one arm and one leg, except under the most favorable conditions. Where the patient has not lost much blood, is not in shock, and in the adolescent period, I amputate one leg (if both are crushed), put the patient to bed, use restorative measures, and if the patient rallies, in from six to twelve hours, I amputate the other.

Whenever I have performed synchronous amputations, or my confreres, nearly all have died in profound shock. The shock from the injury, and from loss of blood, and also added to it, the exposure (it often being hours after they are injured before they are conveyed to the hospital; or they are transported many miles in a box car or caboose, then taken by the patrol wagon and jolted for another mile or two, to a hospital).

Added to all this the shock of an anesthetic, and an amputation, what can we expect but a fatal result?

CRUSHING INJURIES OF LEGS AND FEET.

Case 1.—A boy of 7 was brought to the hospital with one leg crushed at the thigh, and an arm crushed near the shoulder. I first amputated the leg at the thigh (upper third), *then* allowed him to partially recover from the anesthetic before I amputated the arm. We transfused this patient for five days before he was out of danger. This was before the days of adrenalin chlorid, or nerve blocking with cocain.

Some ten years afterward neuromas formed in the axilla on the ends of the divided nerves.

Each neuroma was dissected out, the nerve injected and incised without any apparent shock.

Case 2.—A patient, 18 years of age, in trying to board a train, fell under the wheels, requiring an amputation of one leg, 5 inches below the knee, and crushing all the toes of the other foot. He was in such shock I waited twelve hours and then did a Baudens' amputation of the foot. He made a prompt recovery, and resumed his work as a fireman.

Six patients with both legs crushed above the knees, died in profound shock six to twelve hours after the accident. They did not respond to stimulation, and no efforts were made to amputate.

Another with both legs crushed, one at the knee joint, the other six inches above the ankle. I amputated at the middle third of the thigh and twelve hours later amputated the other 4 inches below the knee. A minimum amount of the anesthetic was used, but the patient was nearly pulseless at the close of each operation. He made a prompt aseptic recovery.

Case 6.—C. T., aged 25. We did a partial amputation by Baudens' modification of the Lisfranc method, using a plantar flap. The flap was stitched in position with a silkworm gut. The patient was now placed on the opposite side and a subcutaneous tenotomy of the tendo Achillis performed. The tenotomy wound was closed with collodion. Primary union of the flap, and tenotomy wound. At the present time flexion and extension are perfect, and apparent regeneration of the tendon has taken place.

Case 7.—G. C. Crushing injury to the left foot, requiring amputation. The foot was amputated by Baudens' modification of the Lisfranc operation. The dorsal surface was so crushed that only a plantar flap could be secured. About half the skin on the plantar surface of each toe was included in the flap. This gave us a moderately loose flap when sutured in place. The flexor and extensor tendons were sutured over the ends of the sawed metatarsal bones. A moderate amount of gauze was applied over the stump, the patient was turned on the opposite side, and with a small tenotome the tendo Achillis was divided subcutaneously, after which the wound was sealed with collodion. The foot was placed in the exaggerated flexed position for four weeks, being held by strips of adhesive plaster, extending around the foot and up the leg. The young man plays football and baseball, flexion and extension being perfect. The tendo Achillis is of normal size throughout its entire length, and apparently regeneration has taken place, as its functional use is perfect.

Case 11.—Crushing injury to the dorsal surface of the left foot, close to the distal ends of the metatarsal bones. A steel rail having fallen on patient's foot and across the base of his great toe, crushing the surface of the dorsal surface and the long bones. He refused operative treatment for seven days, when gangrene of all the toes was present. I amputated the foot by Hey's modification of the Lisfranc operation, but had very little hope of saving the foot. The patient made a very rapid recovery. The flexor and extensor tendons were sutured in place with silkworm gut. The tendo Achillis was now divided subcutaneously, after which the skin incision was sealed with collodion. The foot was kept in the exaggerated flexed position for four weeks.

Case 111.—W. R. Q., aged 22, crushing injuries of both feet. The right leg was amputated 8 inches above the ankle, and the left foot was amputated according to Baudens' modification of the Lisfranc operation, using a long plantar flap. The flexor and extensor tendons were sutured over the end of the stump. The tendo Achillis was divided subcutaneously and the skin incision healed with collodion. The foot was placed in the exaggerated flexed position and held there with broad strips of adhesive plaster. Primary union was complete at the end of four weeks. August 1 he was back at work firing. The functional result is perfect.

SCAPULO-HUMERAL AMPUTATIONS.

One case of crushing of the shoulder and arm was transported 120 miles, to the hospital, put to bed for twelve hours, and transfused with saline solution. I then performed a scapulo-humeral amputation, with but a minimum amount of shock. He made a prompt recovery and returned home the thirteenth day.

January 1, 1907, I was called to see a switchman with a crushing injury to the forearm, arm and shoulder. Active hemorrhage was going on from the divided axillary artery, which, on

account of its high division, the wagon men were unable to control. The patient was nearly exsanguinated. I injected the larger nerve trunks with saline solution, then divided them and the arm where the greatest crushing had taken place. On account of the extensive crushing of the shoulder, it was found necessary to do a scapulo-humeral amputation, which we did by the Berger method, with this exception. We removed the humerus first with its articular head, then ligated the axillary high up, then removed the outer third of the clavicle, which enabled us to ligate above the transversalis colli artery and give us a nearly bloodless field. The skin lying between the clavicle and the spine of the scapula was so devitalized that we were tempted to remove it, but allowed nature to draw the line. Less sloughing occurred than we expected. A surface about 4 inches in extent, filled in by granulation.

SKULL FRACTURES.

We have treated 25 cases in five years, 22 were compound comminuted; 2 were depressed. Four of the compound variety died without regaining consciousness, because of extensive laceration of brain tissue.

All were operated on, immediately within three or four hours after receiving the injury. All were fractures of the parietal or parietal-temporal or parietal-frontal. In the fatal cases the line of fracture extended into the base.

All but two that recovered returned to the railway service.

FRACTURES OF THE FACE FROM THE SKULL.

Four cases of this variety have been under observation. All were treated by immobilization, by wiring the teeth of the inferior to the superior maxilla, then applying a 4-tailed bandage to the chin to help support the jaw.

The period of disability was about four weeks.

FRACTURE OF THE STERNUM.

We have treated 2 fractures of this variety. One fracture was received by a passenger who was in a wreck and fell forward, striking the sternum on the corner of a car seat. The line of fracture was transverse, at the point of union of the manubrium with gladiolus. She remained away from her employer's office but a few days.

The second fracture was received by a switchman who fell from the top of a car. He was off duty about two weeks.

FRACTURE OF THE CLAVICLE.

The Sayre method or some modification of it has been our favorite method of treating this class of fractures. A slight over-riding has been present in a few cases. We treated one case, an adult, by keeping him on his back without a pillow for three weeks. No deformity at the point of fracture was the result. I could not keep the fractured ends in place, if he stood on his feet.

I have found it an excellent plan in all cases to place patients on their backs for three or four days, then applying the Sayre method and allow them to go about.

FRACTURE OF THE RADIUS AND ULNA.

We have treated this class of fractures with both forms of dressing. The dorsal and palmar splint, and plaster-of-paris, or sodium silicate casts. Our results have *not* been as satisfactory when the board splints have been used.

We have used the board splints when the wrist was badly swollen, and the plaster or silicate in the absence of swelling, or in cases of compound or comminuted fracture at the wrist joint. Our results have been uniformly satisfactory.

FRACTURES AT THE ELBOW JOINT.

We have treated but two cases of this variety. The injury in both was the elbow joint was caught between the deadwoods. Both were compound comminuted fractures, both recovered with stiff elbows, but with useful arms. One continued at his occupation as switchman, the other as an office employe.

FRACTURE OF THE METACARPAL BONES.

We have treated this class of fractures by placing a roller bandage or a ball the size of a baseball in the palm of the hand, and fixing it firmly in place with adhesive plaster and a roller bandage.

FRACTURE OF THE PHALANGES.

We use the ball splint exclusively at the present time in treating this class of fractures.

The dorsal and palmar splint held in place

with adhesive straps has given satisfactory results.

SIMPLE COMPOUND OR COMPOUND COMMINUTED FRACTURES OF THE PELVIS.

Three patients with simple fracture of the pelvis recovered. One was a fracture of the pelvic brim. One was a separation at the left sacro-iliac articulation, his left leg was paralyzed for ten days, but he eventually made a fair recovery. The third was a simple fracture of the ramus of the pubes.

Five with compound comminuted fractures died in from twelve to seventy-two hours after the receipt of the injury, in profound shock. We did not attempt to operate.

All were crushing injuries received while making a coupling. One who lived seventy-two hours refused an operation. I entertained some hopes of recovery in his case, if we had been allowed to operate.

FRACTURE OF THE OS CALCIS.

We have treated 8 fractures of this variety, two were compound. In one we did a partial amputation some three months after the accident. Both were car wheel crushings. Three were complicated by fractures of the tibia. Two were received by trainmen by jumping to the ground from the top of cars. One was not suspected at the time, but was made manifest later by exudate.

COMPOUND, COMMINUTED OR OBLIQUE FRACTURES.

In this class of fractures, our results have been very satisfactory. I have included in this classification one leg that a car wheel had passed over.

COMPOUND FRACTURES.

We *have not lost a leg, or arm of this class,* when we have attempted to save it. We first satisfy ourselves that there is an adequate blood and nerve supply. All loose and detached pieces of bone are removed. All exposed muscular tissue is covered with gauze, while the part above and below is shaved and scrubbed.

The exposed muscular tissue is then scrubbed with green soap. If the wound is of the punctured variety, it is irrigated with saline or bichlorid solution.

If the foreign body has penetrated deeply, the cavity is scrubbed with green soap, using a gauze sponge in a pair of long forceps. It is then irrigated with saline and bichlorid solution, or if it is probable that the spore of tetanus has been carried into the wound it is carbolized with 98 per cent carbolic acid and the acid neutralized with alcohol, then irrigated with saline solution.

Drainage is always provided for; I always use split rubber tubing or folded gutta percha tissue.

Our method of treating compound, oblique, comminuted oblique, or simple oblique fractures of the lower third of tibia (also in partial amputations of the foot), has been to do a tenotomy of the tendo Achillis and place the foot in dorsal flexion.

In fractures, putting on a cast or plaster-of-paris, or sodium silicate.

Case 1. C. T., aged 56, compound comminuted fracture of the left fibula and a simple oblique of the tibia. One or two small pieces of the splintered fibula were removed. The tenth day I found an overriding of the fragments of the tibia. I did a subcutaneous tenotomy of the tendo Achillis and sealed the incision with collodion. The foot was placed in the exaggerated flexed position and a plaster cast applied, with a fenestrum over the point of fracture. He made a slow recovery, with some shortening of the leg. The tendon is smooth and of normal size.

Case 2. J. F., aged 40, Irish, weight 300 pounds, locomotive engineer, compound oblique fracture of the right tibia and a comminuted fracture of the fibula. I nailed and wired together the fractured fragments of the tibia and performed a tenotomy of the tendo Achillis, sealing the tenotomy wound with collodion. The foot was placed in a slightly exaggerated dorsal flexed position and a plaster cast applied. The patient made a slow but satisfactory recovery, with an apparent regeneration of the tendon and a perfect functional result.

NON-UNION OR DELAYED UNION OF FRACTURED BONES.

The causes found have been muscular and fascial tissue as well as spicula of bone, inter-

posed between the oblique fractured ends of bone. In none of them could reduction of the fracture be satisfactorily accomplished, or the bones held in apposition.

In each case, at the end of six weeks, we cut down on the fractured ends, cut away muscle and fascial tissue as well as spicula of bone, freshened the ends and wired them together. For two years I have been using wire, such as is used by the stove man to support stove pipe. It is nickel plated and will stand a great amount of twisting without breaking. It has the greatest tensile strength of any wire I have ever used.

Drainage, of split rubber tubing, or folded gutta percha was used.

STRAINS.

Under this are included all strains of the wrist, ankle, knee, shoulders and back.

Ankle strains, severe enough to go to the hospital, are first bandaged firmly, then an ice bag is applied for three or four days. Then an adhesive or solicate of soda cast is applied, and allowed to remain from two to four weeks, according to the severity of the case.

At home, the part is bandaged, first wrapping it with absorbent cotton, then a roller bandage is applied. The feet are then immersed in hot water for from one-half to one hour. The foot is then laid on a pillow and a rubber bag one-third full of hot water is laid over the ankle and refilled once every half hour or hour. As soon as the swelling subsides, which is within a week, a cast is applied.

Strains of the wrist are treated by firm bandaging and the application of hot water for a few days. Then an adhesive plaster cast is applied and allowed to remain with frequent inspection for two weeks.

Strains of the back (traumatic lumbago) are treated, when practicable, by the general hot bath and massage. This method can only be applied when a bathroom is accessible. Towels wrung out of hot water and applied to the back has been used in a small per cent of cases.

The method most frequently employed is, we carefully strap the back with adhesive plaster, and over all apply a roller bandage, 10 inches wide, or we often use a crash or roller towel, passing it two or three times around the body, pinning it very snugly in place with safety pins.

INCISED AND LACERATED WOUNDS AND FOREIGN BODIES IN THE EYE.

We have treated 300 cases under this classification. We have found it necessary to enucleate the eye four times. In two, a piece of steel ¼ by ½ inch had entered the eye; in one the cornea was split transversely and the eye collapsed. One case became infected, following an injury from a piece of iron received while chipping.

Traumatic cataract occurred in three cases. One from an injury received by a spicula of glass, from a broken water indicator. A second, from a sharp spicula of steel, which penetrated the lens, and was removed with the electro-magnet. A third was from a sharp sliver of wood entering the eye, carried there by the wind. No infection took place.

We have used the electro-magnet three times. We failed to extract the foreign body with it but once.

The average foreign body found in the eye was cinders from the engine and ordinary dirt blown into the eye by the wind.

Our treatment in this class of cases was to first cocainize the eye, then attempt to remove the foreign body with a probe on the end of which has been twisted a small amount of sterile absorbent cotton. If we fail to remove it with the cotton covered probe, we use the spud.

The after treatment has been one 15 gr. alkaline antiseptic tablet (Seiler's formula) in 1 ounce of water, irrigating the eye every two or three hours for one or two days.

DRUG TREATMENT.

I have made use of but few drugs. Morphia and atropia have been used early to relieve pain, shock and hemorrhage. Adrenalin 1-20,000 in salt solution has been freely used with benefit. In head injuries we use the bromids freely. I do not use alcohol, I can always find something that suits me better.

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DISCUSSION.

Dr. J. D. Milligan, Pittsburg, Pa.: I am greatly pleased with the paper. If I understand the doctor correctly, his observation of 5,000 cases of employes and passengers injured covered a period of about five years. I was struck with the wonderful army of people they are killing and injuring in this Western country—5,000 cases in five years. The fact all escaped tetanus is a remarkable record, and shows you have been particularly careful as surgeons, and that you have escaped with but one case of delirium tremens shows you have good whisky out here.

I was pleased with the doctor's figures, but I have not been so fortunate—we are dirtier in Pittsburg than you are in this country. You are all well aware of the fact that the bacilli of tetanus are derived from dirt, and I think it is contact with the filthy conditions about our railroads that increases the liability to this disease. When we stop to think that many a man is found four or five hours after he has been injured, perhaps in a tunnel or other damp, dirty place, we do not wonder that such things occur. Any injured man not reaching a hospital or an able physician very soon, does not have to lay long before he picks up sufficient bacilli to give him all the trouble he needs. I must say that your conditions here must have the advantage over those where we live and try to save lives. We have not been able to parallel your results.

Dr. A. B. Brumbaugh, Huntington, Pa.: I desire to take a little exception to Dr. Webster's theory as to the cause of tetanus. Formerly the common cause of tetanus was the nail puncture. With the advent of needle-pointed wire nails, tetanus has practically disappeared as the result of nail punctures. The old nail had a blunt end, and when it went into the flesh it carried with it a little portion of the skin and deposited it at the bottom and with it the germ. Hence the common supposition that nail punctures produce tetanus. A pointed nail passes through the shoe, but it has been practically cleansed and made bright, and deposits nothing at the bottom of the wound.

The author states he does not believe in synchronous amputations, that the patient usually dies as the result. I have had 7 synchronous amputations and they all lived. I performed the operation as quickly as possible after the accident. This is my observation: That a patient who is depressed from an injury will improve under the anesthetic, and frequently when the operation is ended the patient is in better condition than when it is begun. I spoke of this in the presence of Dr. Joseph Price, of Philadelphia, only a short time ago, and he said it was his observation also that patients frequently improve under the anesthetic and that when the patient passes from the surgeon's hands he is in better condition than before the operation. Five of the cases referred to had to be transported either to Altoona or to Harrisburg for operation. My experience has, therefore, been different from the doctor's.

Dr. A. R. Mitchell, Lincoln, Neb.: I am very glad to have heard this paper, because I think I must be considerably out of date in following the course that has been mine during the last few years. The last gentleman mentioned the fact that in synchronous amputations his patients were in better condition when he finished operating than when they were placed upon the table. Three years ago I read before this Association a paper upon the subject of immediate operation and took the ground that of all the stimulants we possess there is none equal to ether. The experiments of a number of investigators have shown that with the exception of normal salt solution we have nothing which will raise blood pressure or place the patient in a more favorable condition than ether, and that the action of the salt solution is only transitory.

In regard to tetanus, I think the advent of the wire nail has undoubtedly had a great deal to do with the lessening of tetanus. But it may be I have been wrong in the treatment of these wounds. It has been my custom to lay these wounds open freely to the bottom and drain thoroughly. And in the treatment of sprains my method has not been orthodox, according to the doctor's idea. In case of sprain of the ankle I have used the strapping process for many years with few exceptions, with bet-

ter results than from fixed dressings. For example, in treatment of sprains of the wrist, instead of using hot or cold water I adjust a tight strap (not tight enough to compress the vessels) and adhesive plaster, followed by a bandage and free use of the wrist afterwards. This gives me better results than any treatment I have used.

Dr. J. E. Owens, Chicago: The pointed nail in use now decreases very much the cases of tetanus. During the period of construction of the Columbian Exposition we had a large number of nail wounds, both of feet and hands. In addition to sterilization of the surface preparatory to operative steps, the wound was laid open sufficiently to curette to the bottom and then it was medicated with 95 per cent carbolic acid. I do not think that at that time very much attention was paid to the use of alcohol within the wound afterward. Then the wound was packed with sterilized gauze and drainage kept up, allowing the wound to heal from the bottom rather than close in its superficial portions. I regret to say I have not the statistics, but according to my recollection no case of nail wound of hand or foot was followed by tetanus and that treatment was constantly administered. Dr. S. C. Plummer, of this city, one of the temporary surgeons at the time, made a report which is exceedingly interesting and which doubtless can be procured from him.

Dr. E. S. McDonald, Cameron, Mo.: It appears to me that the success of treating the wound does not depend so much upon whether it is produced by a blunt nail or a sharp-pointed nail as upon absolute disinfection of the wound. And, as the doctor who presented the paper so ably stated, a strong solution of carbolic acid, properly applied to the bottom of the wound, will undoubtedly disinfect, it does not matter what the wound was produced by—blunt or pointed nail or other agent.

In regard to sprains, put them at physiologic rest, whether a strap or plaster-of-paris be used, and in most cases the results will be what you desire.

So far as delirium tremens is concerned, as our friend from Pittsburg attributes it to the quality of the whisky used in the West, I want to correct that impression; it is not so much due to this as to the tremendous prohibition sentiment pervading this western country. (Applause.)

Dr. L. C. Henley, Chicago: I believe most of the members have missed what I consider one of the principal points of Dr. Webster's paper. I have treated quite a number of nail wounds, and probably no nail puncture is considered worse than that produced by a nail which has done duty in an old cattle car. Dr. Webster mentioned that besides cleaning the surface around the wound he carefully trimmed away the calloused skin near the wound. This I believe to be one of the principal things to be done. A nail puncture always tends to come together. If you trim this skin away you will notice that nine times out of ten it will remain open. I have never opened such a wound. I always take first a small probe wound with a little cotton, and very often can extract with this a small foreign substance, generally a piece of the stocking or sometimes a piece of leather. Then I wind another probe with cotton and saturate it with 95 per cent carbolic acid and put it in, and, like Dr. Webster, I have never had a case of tetanus.

Dr. J. H. Stealy, Freeport, Ill.: During the last summer I have seen two cases of tetanus due to nail puncture. Neither one of these cases had received any attention whatever. When I saw them the wound was entirely healed and it was very difficult in one case to find where the nail entered. The patients were in convulsions when I saw them. I administered antitetanic serum freely, but both patients died. They originated in communities where there has been considerable tetanus. In one case there were during the last couple of years two or three people along that valley who died of tetanus, and in the other case a person living in the immediate neighborhood died of tetanus during the last year. I have always been in the habit of cocainizing and laying the wound wide open. Several times I have attempted to swab the wound out, but have failed. Perhaps my cotton or whatever preparation I used was not as adhesive as some others. But personally I find that the best way is to cocainize, take the scissors and trim off ragged edges and lay it open. This has given me better

results than when I have attempted to swab the wound out with cotton and not be able to see what I was doing. I always use 95 per cent carbolic acid. I believe the reason the reader of the paper has not had more tetanus is because there is no tetanus in that part of the country. We have in Freeport an alley where there have been tetanus germs. Every horse which has had a nail get into his foot in that alley has died of tetanus.

Dr. Webster (closing): I am very glad my paper has brought out so valuable a discussion. One factor that has, I think, very largely tended to lessen tetanus in cases of nail puncture and puncture wounds generally has been the knowledge that has been gained in the last ten or fifteen years in regard to the tetanus spore. The incising of the wound always commends itself to me except for the reason that it produces a greater disability, the patient being disabled for perhaps a week or ten days. I first trim away the calloused layer, then take what is called a small probe, which is not a line in thickness, twist cotton around it, dip it in carbolic acid, and carry the probe with a rotary motion to the bottom of the wound. It is accomplished very easily, it almost falls there, because the horny layer has been trimmed away and there is present only soft muscular tissue. I carry the probe down five or six times. When the wound has been carbolized five or six times the opening has been enlarged until it is nearly ⅛ inch in diameter, and there is perfect drainage. I do not mean, therefore, to carry the probe down simply once, but five or six times. Then I neutralize with alcohol so the carbolic acid will not continue its destructive action, carrying the alcohol down five or six times as I have the acid. In stating the period of disability as only three days I do not mean that the patient is entirely well at the end of that time, but that is the average disability under this line of treatment. It certainly has been satisfactory in my hands, both in the recovery of the patient and in the pay-roll of the company, the latter of which is an important item to be considered.

In regard to synchronous amputations, I am glad somebody has had better results than I have in these cases. In an active emergency service of some fifteen years in two hospitals and four years in the County Hospital, I observed only two recoveries in synchronous amputations, and I am not an exceptionally slow operator in amputating.

In regard to tetanus, we know that experimentally it has been quite easy to demonstrate that the tetanus spore is found in the top layers of the soil, usually in black loam and especially in the soil of gardens and in horse manure. A nail which has been dropped along the right of way of a railroad is very apt to come in contact with the spore, and an employe may step upon it. Oxygen will inhibit the development of the spore. We have a system whereby the foreman of a gang of track workers does not allow the patient to go home, but sends him to the emergency office, where he is treated, after which, if the wound is at all serious, he is taken to the hospital. I think the element of time counts for a great deal in this class of injuries. If they can receive proper treatment within the first hour we can reduce our infections to the lowest point as compared to treatment following a period of four or five hours after receipt of the injury.

In regard to treating sprains, in treating so large a number I have had to suit the treatment somewhat to the individual. With the average Pole or Lithuanian, only a few lines of treatment appeal to him. One is the plastic dressing. I have never had but one person of those nationalities remove a plastic dressing, and the manufacturers have been liberal in supplying such dressings. These patients will remove almost any other form of dressing. I have tried the strapping method, but the strap was removed because it hurt, and for that reason I have used with this class of patients other kinds of treatment almost exclusively.

I think the use of alcohol to neutralize the effects of carbolic acid has not as firm a hold on the minds of the surgical world in general as it ought to have. This is especially true of those who are not engaged in emergency surgical work.

In regard to Chicago having better whisky than Pittsburg, I do not know about that. Perhaps our people have greater resisting power

than those in Pittsburg. The average railway employe in Chicago is a smoker, and that is the only way I can account for it. I have never tested the quality of whisky either in Pittsburg or Chicago.

THE CONSUMPTIVE TRAVELER.

There can be no two opinions on the proposition that it is undesirable that persons suffering from tuberculosis of the lungs, should be permitted to ride in the ordinary railroad cars. Visions appear before us of tubercle germs on the blankets in both the tourist and standard sleepers; of the same germs being secreted in the curtains, ready to invade the lungs of the healthy traveler, and there wreak the injury which they delight to indulge in. How to prevent this is the subject of essays, speeches, protests and resolutions. However much the railroad people may desire not to carry passengers suffering from tuberculosis, it is impracticable for them to submit suspected persons to a medical examination while the train waits. Such a means of procedure would be expensive, and would frequently end in lawsuits for detention that would tend to impair the railroad treasury. While the transportation companies are presumed to be able to refuse to carry passengers whose presence might be a menace to the other passengers, there is no authority, of which we are aware, for them to refuse to carry a consumptive, and no law which will permit them to insist that the consumptive passenger obey any rule of conduct that cannot be enforced against other passengers. The suggestion has been made that state boards of health make rules governing the carrying of consumptive passengers on trains, but it is likely that this would lead to confusion and lack of enforcement of any rules. Some eminent lawyers question whether state boards of health have the power to enforce rules as against interstate passengers, and presumably federal laws would be inoperative as against passengers who are journeying only within a state.

The ordinary citizen who is not himself traveling, would be disposed to resent any regulation that would prevent a consumptive from traveling to a distant point, to die among his friends. In no country are there any efficient rules adopted for the safety of the public, against the invasion of tubercle germs from fellow passengers. It is probable that in those countries where the railroads are owned and operated by the government, and where the officials are inclined to be autocratic, the officials come the nearest to enforcing what mild rules may exist as to not permitting objectionable passengers to travel. But in this democratic country, where one man is as good as another, if not a little better, the theory is that nearly everybody should be allowed to travel who can pay for a ticket. Besides, it is humane to be considerate of the sick and helpless, and the kind official can generally be found lending a helping hand to the sick traveler, who is not absolutely broken out with smallpox, instead of driving him off from the property of the railroad company.

The railroad companies, and the Pullman company, too, are supposed to do their best to properly cleanse their cars at the end of their runs, and the public generally commends them for what they do in this regard. If the sick passenger, and his friends who travel with him, can be urged to be as considerate of other passengers as they should be; and if the friends of the hopeless consumptive will stop sending him on a long and hopeless quest in search of health in some remote region of the country, the general public would be safer. While this is true, it still remains to be said that there is much to be done by state boards and federal boards of health and the railroads in co-operation, to make railroad traveling less dangerous to the individual who, while free today from infectious diseases, may be in such a weakened condition that his system is a good working ground for the roaming germs that may have been given forth from the diseased organs of the hopelessly sick fellow passenger.—*Med. Sentinel.*

Chloroform is the most potent and therefore the most dangerous anesthetic. Hence an excess is often administered. The dosage cannot be measured by the amount of chloroform poured from the bottle. An excess may be taken in by one respiration enough to arrest the heart.—*Walsham.*

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THE ANNUAL MEETING.

Owing to the untiring exertions of the Executive Board, another successful meeting has been scored.

The papers were all of a high standard, and on a rather more varied list of topics than usual.

The comments of the lay press on the President's address will be found elsewhere in the present issue.

The amendment to the Constitution making the dues of Associate members uniform was timely, avoiding as it does the vexed question of extra dues when Delegate members are selected, as well as simplifying the bookkeeping.

Another interesting discussion was had on "Trauma as a Etiologic Factor." The question of the alleged traumatic origin of appendicitis must be looked upon as settled. When operators like Ochsner with the enormous experience of over 3,000 cases look upon this etiologic factor as extremely unusual, the rest of us must perforce acquiesece in this opinion.

Another question that seems to be settled is the effect of the railroad man's calling as a factor in the causation of diabetes. Thanks to the labors—extending over two years—of Dr. Owens and his associates on the Committee on Diabetes, it has been found that diabetes does not enter into the mortality or disability statistics of American railways to any appreciable extent. Either the alleged frequency in France, to which reference is made, is due to some difference in the modes of living, or possibly, the figures do not deal with such large numbers of employes as those furnished by Dr. Owens and his correspondents.

While Dr. Wright the president-elect has held numerous positions of trust in both the old International Association and in the Academy, he was not chosen for the highest office. His selection comes as a well-merited—albeit tardy —recognition of his services.

The Association enters on its first lustrum flourishing like the proverbial bay-tree.

Miscellany.

KNIFE OR IMPRISONMENT? CHICAGO DOCTORS SCOFF.

APPENDICITIS STATEMENT OF PRESIDENT HOY OF RAILWAY SURGEONS "FANTASTIC," "RIDICULOUS," REPLY PHYSICIANS.

A number of Chicago physicians expressed their disagreement with the extreme views of Dr. W. S. Hoy, president of the American Association of Railway Surgeons, regarding what ought to be done to physicians who don't make timely use of the knife in appendicitis cases.

In an address before the railway surgeons in this city Thursday Dr. Hoy asserted he thought it was high time for legal recognition of and punishment for delay in diagnosis of and operation for appendicitis.

"It is a most extravagant statement," said Dr. William E. Quine, 103 State street. "One might as well advocate jail sentence for the doctor who refuses to administer castor oil. It is approaching a degree of fantastic ideas that is surprising for a physician.

"Operations for appendicitis should be timely, but a thousand complications might arise to interfere with the use of the knife. The idea of legal recognition in the matter is ridiculous."

"I don't care to be quoted," said another physician, "but it is hardly believeable such a statement should be accredited to a physicion. Why not make the field broader and say failure to cure in every case should be subject to imprisonment for the doctor. The doctor has enough troubles without running the gantlet of jail sentence every time a man comes to him with a pain in his side."—*Chicago Tribune.*

SURGERY BY LAW.

It would be natural, indeed, if the public should betray some symptoms of uneasiness at one of the suggestions made to the Association of Railway Surgeons. The president of that body, commenting on the dilatoriness in the use of the knife, predicted that an enactment will be placed on the statute books punishing delay in diagnosis and operation for appendicitis. The inference seems to be that surgeons are entirely too slack to take advantage of the opportunities presented by a pain in the side.

Explanation will be necessary, doubtless, to allay the fears entertained by the public. The popular idea of a surgeon is that he is usually quick to grasp the occasion to use his knife, and that he needs no encouragement in the matter of human carving. There is, therefore, just reason for apprehension that if the worthy president's prediction is verified and the law takes notice of appendicitis as a great national scourge, the unhappy public can never tell what instant it may be hurried to the operating table and lacerated in its tenderest feelings. A pain in the side will be a most formidable offense in the eyes of the law, and the surgeon, especially if business has been dull and he needs the money, will ignore the protest of his victim and order him to the hospital under the guardianship of the police. For while the law is supposed to provide for speedy operations, nothing has been said about the disposition of the surgeon who makes a wrong diagnosis and inflicts unnecessary torture. He will be supposed to have erred on the right side—mentally as well as physically.

Undoubtedly there are some tender hearted surgeons who take chances in delaying operations. Also there are slothful men of science who are careless and slow to act. It may be well to punch up these negligent brethren as their lack of wisdom deserves. But it is hardly fair to the public to put a premium on immediate carving and to scare a surgeon by law into ripping open the bodies of his patients merely because he himself can take no chances in a diagnosis, to say nothing of the ambitious young surgeon who carves for practice and who has legal indorsement for his excavations. Before the public is thoroughly frightened into the belief that it is easy prey for the hospital, the operating room, and the scalpel, it should be explained that the proposed law is for its protection, not its peril. And, perhaps, with amendments curbing young professional zeal and ambition, and specifying operations as necessary cures and not haphazard inquiries—always providing severe penalties for surgical ignorance—it may prove a blessing.—*Editorial Chicago Tribune.*

Translations

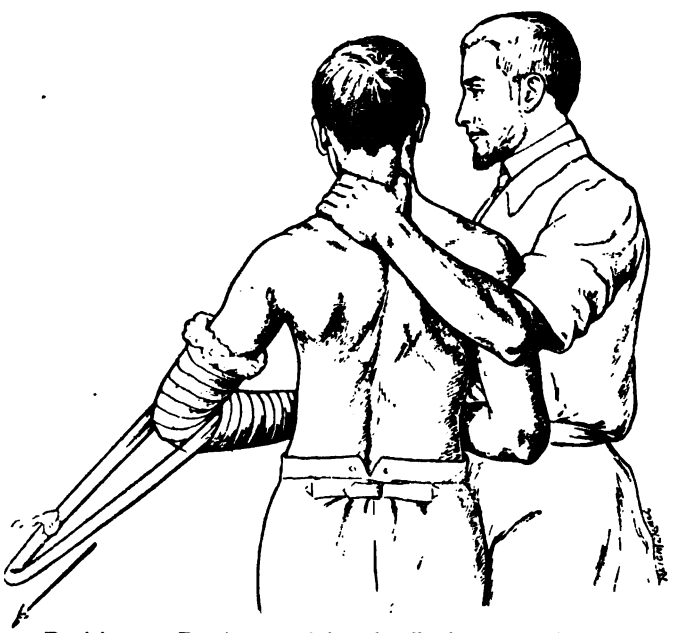
ADVANTAGES OF ABDUCTION OF THE ARM IN THE TREATMENT OF FRACTURES OF THE SHAFT OF THE HUMERUS.

BY M. SAVARIAUD, PARIS, FRANCE.
(Translated for the RAILWAY SURGICAL JOURNAL.)

The reduction of fractures of the middle of the humerus or of its upper third, by the aid of continuous traction, followed by the application of a plaster cast, is an excellent method from which we have the right to expect the best results. However, the use of Hennequin's apparatus *, in more or less experienced hands, is often followed by a defective result. The overriding of the fragments is generally corrected, but an angular deviation with the apex out frequently persists. I have often seen this deformity on removing limbs from the casts after they had been put up by the internes. It is easy to avoid, and to overcome if union is not very solid.

[Hennequin's apparatus was described and figured in the *Railway Surgeon* for April, 1902.]

What is the cause of this deformity? Simply the fact that the upper fragment acted on by the muscles inserted into the upper end of the humerus, tends to be carried out, in the same manner as the upper fragment of the femur is carried out in a fracture of the upper third or of the shaft of that bone. The lower fragment is carried down vertically by the weight of the limb. In addition to the muscular action, there is another cause for this defective orientation of the upper fragment, the instinctive position which the patient often assumes while the cast is being applied. When this is not done with the necessary dexterity, the patient suffers, especially at the moment when the upper ends of the bandage are brought under the axilla. He instinctively contracts his arm, and at the same time draws back, inclining his body to the opposite side, consequently tilting the upper fragment. If we do not take the precaution to calm the patient, to place him again in position and to coapt the fragments, the same thing will occur again and the arm will be fixed in this defective position.



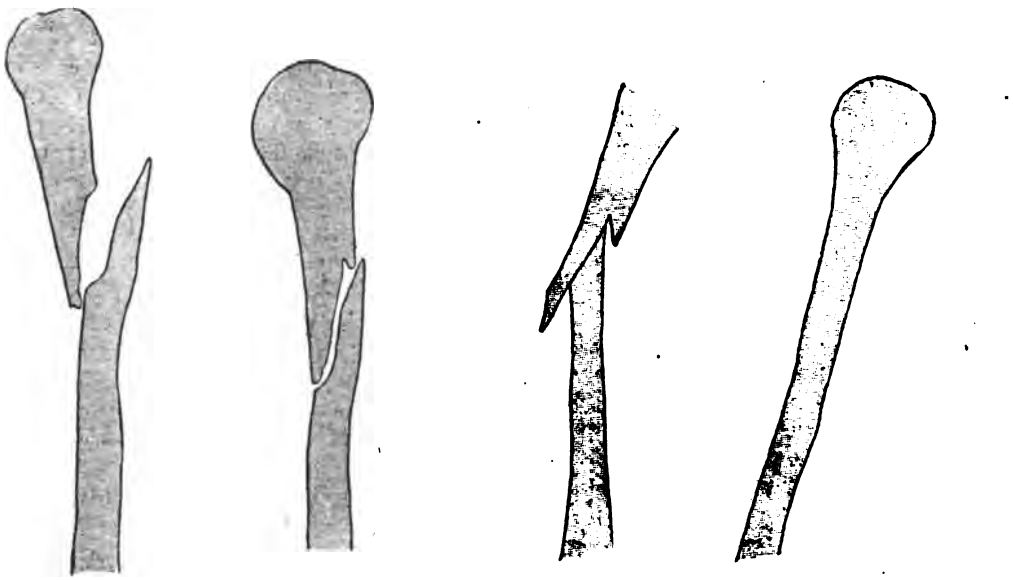
Position to Be Assumed by the Patient and Assistant, Showing Direction of Traction.

I have modified Hennequin's apparatus as follows:

1. Traction is exerted obliquely by a rub-

ber tube fixed close to the floor, for example, on the foot of the bed.

2. Counter-extension is carried out by an assistant who pulls the patient's trunk to the opposite side, at the same time molding the scapular part of that apparatus to the shoulder. This avoids vertical counter-extension. I have noticed that extension with this elastic tube is gentler, easier to graduate, and always better borne by the patient.



a Arm of Mme. L.... After Being Removed from the Hennequin Apparatus; a' The Same Arm in the Modified Apparatus; b Arm of Mme. R.... Put up in the Hospital; b' The Same After Being Removed from the Modified Apparatus.

3. Owing to the abduction of the arm, the plaster bandage is easily brought under the axilla and the bandage unrolled without causing any pain, which is essential for good reduction. On this account also, coaptation is easier. Nevertheless, while the plaster is drying, care should be taken to coapt the fragments, the palms of the hands acting as splints. The assistant carrying out counter-extension in addition to molding the shoulder hastens the drying of the plaster by the application of hot towels.

4. The dressing finished, the elbow is kept in position by a small cushion, held up by a band passing over the sound shoulder.—*La Presse Medicale.*

HERNIA AS A CAUSE OF DISABILITY.

In general remarks Kjennerud, abdominal hernia has increased in the Norwegian service. From 1879 to 1883, 172 were disqualified in the Norwegian service, from 1893 to 1895, the number amounted to 128; in the Swedish service, from 1898 to 1901, 15.7 per cent in the first year of service and 16.3 per cent in the later years; in Denmark, 1894 to 1902, 2.8 per cent; in Finland, 1886 to 1897, 26.1 per cent; in Germany, 1899 to 1903, 23.5 per cent; in Austria-Hungary, 1883 to 1887, 16.3 per cent, and in 1897, 29.3 per cent; in Italy, 1894 to 1895, 13.5 per cent; in Switzerland, 1883 to 1901, 30.1 per cent; in France, 23.8 per cent; in the United States during the Civil War, 51 per cent; in Roumania, 7.79 per cent. The factors as to ability for service have in process of time changed almost everywhere. In Sweden it has been decided that an intestinal hernia, which can be retained by a truss, does not incapacitate for service not under

arms and a mere predisposition to hernia does not incapacitate; the same holds true in Finland since 1894 and in Austria-Hungary, where, however, since 1902, a pronounced hernia exempts from all service; a simple inguinal hernia that can be retained by a truss does not incapacitate. In France, as well as in Norway and Denmark, all varieties of hernia are considered disabling. In Norway the amount of hernia varies in the several brigade districts. The question of how far the production of hernia is favored by predisposition and to what extent this can be considered a reason for disability is to be answered that, as a rule, an open inguinal ring, from which much more than half the recruits suffer, does not disqualify. There is no doubt that inguinal hernia is sometimes spontaneously cured. At what age and at what period of existence healing will occur cannot be exactly determined, although sudden cases recover the most quickly.—*Military Surgeon.*

CONCERNING AMPUTATIONS.

BY MILES F. PORTER, A. M., M. D., FORT WAYNE, IND.

When, where, and how to amputate, are the questions I desire to discuss. With an increase of knowledge, amputations have become more and more infrequent. Especially is this true of primary amputations. Indeed, as applied to parts of the hands or feet, primary amputations among really good surgeons may be placed among the rare operations. With proper antiseptic treatment the risk of waiting in doubtful cases is practically *nil*, hence it may be laid down as a rule that where there is the least chance of saving a more useful member than can be supplied by the maker of artificial limbs, amputation should not be done. In this connection it should be borne in mind that while it is possible to get a relatively useful artificial foot, the best artificial substitute for a hand is very poor. In rare cases, perhaps, the bad environment would cause one to decide in favor of amputation, but good hospital facilities are now practically always within reach, consequently the lack of them will seldom, if ever amount to an adequate excuse for doing a primary amputation in an otherwise questionable case.

The question when to amputate involves also the question as to the time, when it has been decided that amputation is necessary. When time is necessary to determine the viability of important tissues we should wait, but to wait for the subsidence of shock is worse than folly, for it adds to the discomfort of the patient, and to the risk to his life. To wait until a proper environment can be secured, by transportation or otherwise, for the proper conduct of the operation, is of course the part of wisdom.

In deciding where to amputate we should keep in mind the fact that an amputation is a sacrifice, and hence it is to be made as light as is possible. Again, it is the character and quality of the tissue to be saved or sacrificed, rather than the quantity, that should concern us. To save an extremity or a part of an extremity that shall be to its possessor, during the remainder of his life, a thing of ugliness, and a curse, is to increase rather than mitigate the sacrifice.

With the improved technic of today a slight additional loss of tissue is so small a matter it may be waived in favor of a stump better adapted to service, or to the wearing of an artificial limb.

An ideal amputation comprehends clean, straight cuts with a sharp knife, through undamaged tissues at an ideal point, retrenchment of nerves, perfect hemostasis and coaptation, proper disposition of scar, and correct flap formation, all accomplished with perfect asepsis, a minimum amount of trauma, and in the least possible time consistent with perfect work. Such an amputation wound will and should be allowed to heal before changing the original dressing. To make flaps of damaged tissue with the consequent risk of sloughing or undue formation of cicatricial tissue is unwise except in some cases where length of stump is quite important, as, for instance, in injuries of the feet or hands where ofttimes locomotion or prehension is much improved by a slight addition in length of the stump. Irritable and painful scars are often due to unnecessary cicatricial formation, consequent upon the use

of damaged tissue in the flaps. However, I do not want anything I have said on this subject to be taken as a warrant for unnecessary sacrifice of tissue, especially in hand injuries and diseases, and more especially where there is a loss of part of the member, making each bit of that which is left, exceptionally valuable to the patient.

In making finger flaps, it may be wise to shorten the member somewhat for the purpose of getting a long palmar flap, with an idea of preserving the tactile sensibility.

Drainage is an acknowledgement of imperfect work or materials, and hence, except in rare cases, inadvisable.

Sutures are sometimes necessary but should be dispensed with when not necessary, which is often the case. In a way we may say all sutures are bad, through and through sutures the worst, buried, absorbable sutures the best. Buried non-absorbable sutures left permanently are inexcusable. Ordinarily a very few sutures to coapt the muscles are all that are required. A very common error is the too tight tying of sutures. They should coapt, not strangulate. Very frequently the most perfect coaptation may be made by the proper adjustment of the dressings and adhesive without a single suture. The advantages of coaptation by adhesive and disposition of dressings, is that the coaptation thus secured is more perfect and yet not so tight as to interfere with the egress of secretions from the wound, while the trauma and infection-atria are reduced to a minimum, thus lessening the danger of infection. Moreover, this method of coaptation conduces to the comfort of the patient, and minimizes the scar formation. This latter is of less importance in amputations than in surgery of the face and neck, but is worthy of note.—*Fort Wayne Journal-Magazine.*

The prognosis of *renal injuries* is always very serious on account of the risks from hemorrhage or infection. Recovery is often, also incomplete; long-persisting fistulæ may be left, and hydronephrosis may occur from dislocation of the organ. Interstitial nephritis and calculi also occur as sequelæ.—*Schlesinger.*

Notices and Reviews.

"Practical Fever Nursing" By Edward C. Register, M. D., Professor of the Practice of Medicine in the North Carolina Medical College. Octavo, 352 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1907; Chicago: W. T. Keener & Co. Cloth, $2.50, net.

This volume is a good one in most respects. A nurse will find valuable non-technical descriptions of the commoner fevers—pathology, symptoms and prognosis. She should know what complications may ensue and how to aid the physician in anticipating them. But of what advantage is it to the nurse to give her a long description of the differential diagnosis of typhoid?

Again is it important to discuss with her the purely drug treatment of disease? She should know how to give medication in the best way. She should also know the first symptoms of overdosage. She should be taught how to give a bath, but should she judge what food is needed for the patient? This ought always to be left entirely in the physician's hands. His own knowledge of the value of food should be profound enough from every aspect to dictate absolutely what a patient's diet should be. A nurse should be able to prepare this food if called upon, but only when ordered by the physician in charge.

In other respects this volume is well worth possessing. Most physicians could read it with profit, and nurses will find in it many excellent hints. R. W. CORWIN.

"American Practice of Surgery." A complete System of the Science and Art of Surgery, by Representative Surgeons of the United States and Canada. Editors: Joseph D. Bryant, M. D., Albert H. Buck, M. D., of New York City. Complete in eight volumes. Profusely illustrated. New York: William Wood & Co. Sold by subscriptions only. In extra muslin binding; per volume, $7.00: in brown leather, per volume, $8.00; in extra half-morocco, per volume, $9.00. Vol. III. MDCCCCVII. Royal Octavo; 775 pages; 9 colored and plain plates; 311 illustrations.

The volumes of this system continue to appear with commendable regularity. The present one comprises three parts devoted to Poisoned Wounds, Including Bites and Stings of Insects; Injuries and Surgical Diseases of Bone, and Diseases and Injuries of Joints.

The article on Rabies is quite up to date. Emphasis is laid on the presence of Negri's bodies as a means of establishing the diagnosis.

The first article in the part devoted to Injuries of Bones is on Fractures. One naturally turns to this with interest, but we regret to state it is not especially illuminating. We would be glad, for example, to see statistics as to the frequency, etc., of later date than 1872. Gordon's pistol-shaped splint is advised in Colles' fracture.

A separate section of 40 pages is devoted to Pseudarthrosis. Parkhill's clamp is strongly recommended in ununited fracture. The section on Inflammatory Affections of Bone is a posthumous one, being contributed by the late G. A. Peters, of Toronto. There are sections, likewise, on Inflammatory Diseases, Syphilis and Tumors of the Bone.

Over 160 pages are taken up with a full account of Tuberculous Diseases of Bones and Joints, by A. Primrose, also of Toronto.

The article on Wounds of Joints in referring to the work of Murphy and others, does but scant justice to the satisfactory results obtained in overcoming ankylosis by the interposition of substances between the joint surfaces. "Later reports are essential," we read. Murphy's most successful case was not reported for several years after the operation, at which time locomotion was perfect without cane or support of any kind.

The volume closes, as usual, with a good index.

"A Text-Book of the Practice of Medicine." By James M. Anders, M. D., Ph.D., LL. D., Professor of the Theory and Practice of Medicine and of Clinical Medicine, Medico-Chirurgical College, Philadelphia. Eighth Revised Edition. Octavo, 1,317 pages; fully illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener & Co., 1907. Cloth, $5.50 net; Half Morocco, $7.00 net.

We have had occasion to refer to the manifold excellences of the present work more than once. The new edition is fully up to the standard of the previous ones. Anders' "Practice" has always been especially strong in the sections on Diagnosis and Differential Diagnosis. These features have been still further elaborated in this edition and the useful tables of differential diagnosis increased.

The articles on Tropical Diseases have been revised and some new ones added. Several topics are seen for the first time e. g. X-Rays in Leukemia, Stokes-Adams' Disease, Vincent's Angina, Intestinal Auto-intoxication and Senile Dementia.

With all these improvements and additions, the work will bear favorable comparison with any one-volume work on Practice.

"Treatment of the Diseases of Children." By Charles Gilmore Kerley, M. D., Professor of Diseases of Children, New York Polyclinic Medical School and Hospital, etc. Octavo, 597 pages, illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener & Co., 1907. Cloth, $5.00 net; Half Morocco, $6.50 net.

After an introductory section comprising about one-quarter of the book, devoted to General Considerations, The New Born and Nutrition and Growth, the various diseases incident to childhood are taken up by systems. The treatment is practically limited to that by drugs, etc., surgical measures being referred to only to emphasize the necessity of prompt operation. In many diseases a short account is given of the symptoms and course to refresh one's memory, and illustrative cases are recounted from time to time. Illustrations are inserted where necessary, depicting apparatuses and modes of applying different remedial agents. There is a very useful appendix giving the doses of suitable drugs for the ages of six months, eighteen months, three and five years.

The remedial measures enumerated are not confined to drugs, we find, for example, sections on heat and cold, climate, etc. There is, in addition, a complete chapter on medical gymnastics containing much information hitherto to be obtained only in special works.

The therapeusis of children's diseases is unsatisfactory—as is well known—owing in great measure to the difficulties of diagnosis. A work of this nature, detailing many of the advances made in this subject in recent years, should prove of great value to the general practitioner, for whom—and not for the student or specialist—the book is written.

Parotitis, when it complicates post-operative convalescence, is almost entirely confined to septic cases.—*Bucknall and Tebbs.*

Notes of Societies

ROCK ISLAND SYSTEM SURGICAL ASSOCIATION.

PROGRAM OF FIFTH ANNUAL MEETING, THE ALBANY, DENVER, DEC. 4, 5, 1907.

DEC. 4, MORNING SESSION.

"The Treatment of Burns and Scalds," Dr. F. A. O'Brien, Local Surgeon, Emmettsburg, Iowa.

"Injuries to the Knee-Joint," Dr. E. B. Gilbert, Local Surgeon, Geneseo, Ill.

"Railway Surgery in the Orient," Dr. W. F. Pierce, Local Surgeon, Carson, Iowa.

"Conservative Surgery," Dr. H. M. Dean, Local Surgeon, Muscatine, Iowa.

"Varocose Ulcers—Traumatism as an Exciting Cause—Treatment," Dr. H. E. Campbell, Local Surgeon, Anita, Iowa.

AFTERNOON SESSION.

"The Railway Surgeon and Railway Sanitation," Dr. H. M. Bracken, Consulting Sanitarian, St. Paul, Minn.

"Treatment of Sprains." Dr. Ferd. Engelbrectson, Local Surgeon, Chicago, Ill.

FRACTURES.

"A Demonstration of the Maxwell-Ruth Method of Treating Fracture of the Neck of the Femur" (by invitation), Dr. C. E. Ruth, Denver, Colo.

"Fracture of Neck of Femur, with Report of Three Cases," Dr. E. S. McDonald, Local Surgeon, Cameron, Mo.

"Some Points on Treatment of Compound Fracture of the Leg," Dr. P. M. Burke, Local Surgeon, LaSalle, Ill.

"Demonstration of a New Splint for the Humerus," Dr. S. B. MacLeod, Local Surgeon, Chicago, Ill.

"Colles' Fracture," Dr. W. O. Brown, Local Surgeon, Stratford, Tex.

"The Causes and Treatment of Non-Union in Fractures," Dr. T. H. Wagner, Local Surgeon, Joliet, Ill.

WEDNESDAY EVENING.

Informal banquet at the Albany.

DEC. 5, MORNING SESSION.

THE EAR.

"Some Observations on the Ear," Dr. J. E. Minney, Oculist and Aurist, Topeka, Kans.

"Tonsilar Hypertrophy and the Middle Ear," Dr. F. E. V. Shore, Oculist and Aurist, Des Moines, Iowa.

"A Case of Mastoid Abscess, with Operation and Results," Dr. L. E. Willis, Local Surgeon, Newport, Ark.

UTERINE DISPLACEMENTS.

"The Influence of Trauma in the Production of Displacements of the Female Pelvic Organs," Dr. C. K. Fleming, Consulting Surgeon, Denver, Colo.

"Traumatic Retroversion of the Uterus, with Report of Three Cases," Dr. M. W. Bacon, Local Surgeon, Englewood, Ill.

"Expert Testimony," Dr. F. M. Floyd, Division Surgeon, St. Louis, Mo.

AFTERNOON SESSION.

WOUND INFECTIONS.

"Some Gross Infections of Open Wounds," Dr. S. L. White, Local Surgeon, Ruston, La.

"The Bier Treatment of Acute Infections, with Report of Cases," Dr. A. E. Palmer, Local Surgeon, Morris, Ill.

"Personal Methods in Emergency Surgery," Dr. F. B. Dorsey, Local Surgeon, Keokuk, Iowa.

"A Case of Pulmonary Embolism following Abdominal Operation," Dr. H. A. Leipziger, Local Surgeon, Burlington, Iowa.

"Malarial Hematuria," Dr. T. B. Bradford, Local Surgeon, Cotton Plant, Ark.

"The Use of Antitoxins in General and Localized Peritonitis Caused by Abcess," Dr. P. W. Darrah, Local Surgeon, Leavenworth, Kans.

"Justice the Only Safe and Practical Basis for Settlement in Claims for Trespass," Dr. R. A. Kerr, Local Surgeon, Peoria, Ill.

ASSOCIATION OF ERIE RAILWAY SURGEONS.

At the recent meeting the following officers were elected for the following year: President, Dr. Frank D. Bain, Kenton, Ohio; vice-presi-

dent, Dr. George H. Witter, Wellsville, N. Y.; secretary and treasurer, Dr. B. R. Wakeman, Hornell, N. Y.; and executive committee, Drs. Salem Heilman, Sharon, Pa.; Charles E. Sawyer, Marion, Ohio; and Herbert F. Gillette, Cuba, N. Y.

C., M. & ST. P. RY. SURGICAL ASSOCIATION.

PROGRAM OF FIFTEENTH ANNUAL MEETING, PALMER HOUSE, CHICAGO, DEC. 5, 6, 1907.

"Treatment of Fractures of the Hip," Dr. H. Kessel, Cresco, Iowa.

"Unusual Fractures," Dr. Allen Staples, Dubuque, Iowa.

"Autointoxication After Injuries," Dr. H. B. Hemenway, Evanston, Ill.

"Subparietal Rupture of Kidney," Dr. J. G. Hayden, Chicago.

"Subparietal Rupture of Abdominal Viscera," Dr. W. C. Danforth, Chicago.

"The Problem Presented in the Treatment of Abdominal Contusions," Dr. J. R. Hollowbush, Rock Island, Ill.

"Expectant and Conservative Treatment of Wounds of the Abdomen," Dr. H. H. Clark, McGregor, Iowa.

"Traumatism of Varicose Veins," Dr. A. J. Alcorn, Hermosa, Ill.

"Skin Grafting," Dr. J. F. Pember, Janesville, Wis.

"Amputation of Arm," Dr. D. H. Bowen, Waukon, Ill.

"Burns, with Complications," Dr. W. F. Morrow, Kansas City, Mo.

"Fracture of Pelvis, with Rupture of Urethra," Dr. S. A. Spilman, Ottumwa, Iowa.

The discussion will be opened by Dr. E. E. Munger, Spencer, Iowa.

"Injuries to Knee Joint," Dr. C. L. Wendt, Canton, S. D.

"Observations in the Surgical Clinics of Sweden," Dr. C. F. Larson, Crystal Falls, Mich.

"The Company's Plans for the Examination of New Employes," Dr. A. I. Bouffleur, Chicago.

At a meeting held in Plattsmouth, Neb., recently, the surgeons of the Burlington lines west of the Missouri River organized a society to be known as the Association of Railway Surgeons of the Chicago, Burlington and Quincy. The following were elected: President, Dr. Theodore P. Livingston, Plattsmouth; vice-president, Dr. B. B. Davis, Omaha; secretary, Dr. George F. Roehrig, Denver; and treasurer, Dr. John P. Savage, Sioux City, Iowa.

Personal

Dr. L. W. Littig, of Iowa City, Iowa, was elected secretary and treasurer of the recently organized Second District Medical Society.

Dr. Joseph P. Runyan, of Little Rock, Ark., surgeon for the Rock Island System, has been re-elected dean of the College of Physicians and Surgeons.

APPOINTMENTS ROCK ISLAND SYSTEM.

Dr. C. F. Horner, Tiskilwa, Ill.
Dr. A. Sinning, Bennett, Iowa.
Dr. F. H. Matthews, Liberty, Mo.
Dr. R. T. Nichols, Liberal, Kans.
Dr. D. M. Forbes, Selden, Kans.
Dr. H. P. Routh, Hartford, Ark.
Dr. C. Blickensderfer, Tecumseh, Okla.
Dr. G. B. Van Sandt, Wewoka, I. T.
Dr. I. V. Hardy, Medford, Okla.
Dr. L. H. Huffman, Hobart, Okla.
Dr. F. B. Dorsey, Keokuk, Iowa.
Dr. C. E. Donnell, McLean, Tex.

Tumors of the cerebellum give rise directly only to the two symptoms, ataxia and vertigo. Symptoms due to compression of the surrounding parts are usually absent when such growths are situated dorsally, but are common in basal tumors. When they occasion unilateral paralysis of the 5th to the 12th nerves the tumor is usually to be found on the same side as the paralysis; and the same holds good for the associated paralysis of the abducens. Signs of cerebral compression appear early, and convulsions with opisthotonus are frequent (Oppenheim).

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Listerine represents the maximum of antiseptic strength in the relation that it is the least harmful to the human organism in the quantity required to produce the desired result; as such, it is generally accepted as the standard antiseptic preparation for general use, especially for those purposes where a poisonous or corrosive disinfectant can not be used with safety. It has won the confidence of medical men by reason of the standard of excellence (both as regards antiseptic strength and pharmaceutical elegance), which has been so strictly observed in its manufacture during the many years it has been at their command.

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HEMORRHOIDS.

BY T. P. EDWARDS, M. D., GRANITEVILLE, S. C.

For the past ten years it has been my custom to use operative measures in treating my hemorrhoidal cases, but the invariable objections of my patients and tax upon my time in applying dressings caused me to investigate other methods more acceptable to all. About two years ago my attention was drawn to the fact that Glyco-Thymoline was giving myself and other doctors near to me most gratifying results. I will submit a few cases treated, notes of which were taken at the time of treatment:

About a year ago I was called to visit Mrs. E. F. Found her suffering great pain. I made a digital examination, found hemorrhoids protruding like a bunch of grapes, very much inflamed. I gave an anodyne suppository and in an hour returned to her house, injected 2 ounces Glyco-Thymoline in 2 ounces water, made a thick compress, wet it thoroughly with Glyco-Thymoline pure and applied to anus, with directions to keep it wet with Glyco-Thermoline until my return. Next day found the protrusions nearly disappeared. I continued Glyco-Thymoline three times a day. Patient has not been troubled with piles since. Of course I put the general secretory and excretory organs into activity with suitable remedies.

J. S. applied to me for treatment of bleeding piles. On examination I found two tumors pushing outward the anus, which looked turgid and bled upon handling. I ordered Glyco-Thymoline pure and applied the first dressing and told them to keep compress thoroughly soaked until my return in four hours. I was prompt to do this and found I could handle the parts without any bleeding. A watery fluid was oozing out rapidly. This I watched closely and became satisfied it was due to the exosmotic action of Glyco-Thymoline. I also injected Glyco-Thymoline and water half-and-half. In ten days he was well, to stay well until now.

Mrs. M. S. Presenting internal and external hemorrhoids which had confined her to her room for two weeks. The hemorrhage was so profuse it had been pronounced intestinal hemorrhage. A digital examination settled the diagnosis as a bleeding hemorrhoid. I ordered 1 pint of Glyco-Thymoline with directions to inject 1 ounce every three hours first day, then every six hours. In three days she was well. She complained of no pain at all the second day and slept well the first night after she had used Glyco-Thymoline. I charged her to take exercise in accordance with her strength and laid down rules for good nourishing food. The tonic effect of Glyco-Thymoline on the mucous surface was clearly demonstrated in this case, besides its specific influence upon the hemorrhoids, as she has had no return of hemorrhoids since.

During the first use of Glyco-Thymoline in my hands I had a case of prolapsus ani. In this instance it was an infant 8 months old, the prolapsus being a family idiosyncrasy, as 7 out of 9 children of both sexes, with same parents, were subject to it. The mother was terribly frightened when she unpinned the protector. I reduced it by laying over the tumor a cloth saturated with Glyco-Thymoline 1-3, water 2-3, on account of age. I then ordered Glyco-Thymoline 2 to 4 drams, to be injected pure at bedtime for a month, and the child has never had a return.

B. F. A. Crane, Saginaw, Mich., states: W. F. L., aged 54, giving a history of posterior rectal abscess with external and internal piles, the case also presenting a horseshoe rectal fistula. The hemorrhoidal condition was treated with zinc sulphate and Glyco-Thymoline (gr. ii ss to the oz.) applied frequently. In twelve days the case had so improved that I

was ready to operate. On the pile tumors we used the radical method, clamp and cautery and then followed with a free open incision for the fistula and abscess. After closing, I instituted a local dressing of gauze saturated with Glyco-Thymoline, to be changed night and morning and after each movement; also instructed those in attendance to administer internally 2 drams of Glyco-Thymoline in a half glass of hot water every six hours. In five days the condition was so much improved that the man was removed to his home. Ten days later he was up and around and within four weeks he was firing his boilers and handling 30 tons of coal in twelve hours. Five months have now passed and he has experienced no tendency toward a return of his trouble.

THE SERUM TREATMENT OF EXOPHTHALMIC GOITRE.

Harriet C. B. Alexander discusses the subject and reports thirteen cases. Four principal theories of the disease have been advanced: (1) That it is due to disease of the sympathetic nervous system; (2) that the seat of the malady is the medulla oblongata; (3) that it is primarily a disease of the thyroid gland; and (4) that it is a neurosis.

Modern therapeutic measures have been largely based on the "thyroid' theory. The results of partial strumectomy indicate that the successful removal of a portion of the thyroid gland can lead to cure or to definite amelioration of the condition. On the theory that the thyroid secretion normally neutralizes certain general metabolic poisons in the body, Moebius and others conceived of treating cases of exophthalmic goitre, in which there is presumably an excess of thyroid secretion in the body, by introducing subcutaneously, or by the mouth, the serum of thyroidectomized animals. It was hoped that the non-neutralized general metabolic poisons of such animals would nullify the toxic effect of the excessive thyroid secretion. As to the treatment, experience has shown the great importance of general measures; complete rest for a time, fresh air, careful diet, mild balneotherapy, etc.

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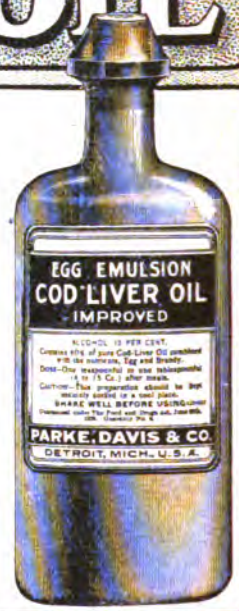

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The Railway Surgical Journal

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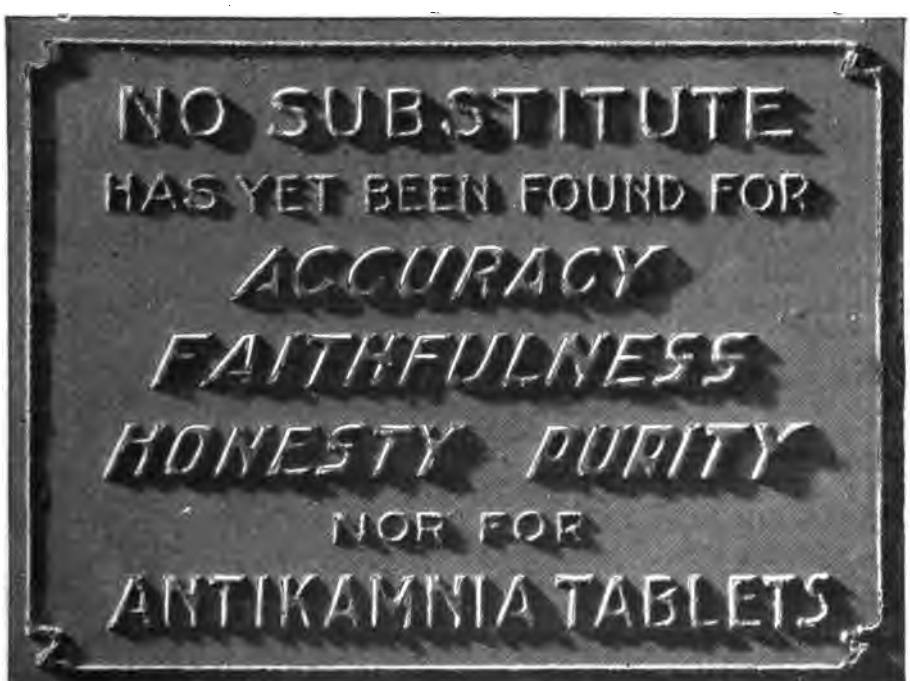

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THE Railway Surgical JOURNAL

VOL. XIV—NO. 4 CHICAGO, DECEMBER, 1907 WHOLE NUMBER 259

SYMPOSIUM ON TRAUMA.

THE RELATION OF PULMONARY AND OTHER FORMS OF TUBERCULOSIS TO TRAUMA.*

W. A. EVANS, B. S., M. D., CHICAGO.

Professor of Pathology in the College of Physicians and Surgeons; Commissioner of Health.

In my experience there is no relation between pulmonary tuberculosis and traumatism. The literature contains some reference to such relation. Such reference is usually to cases of pulmonary tuberculosis in which miliary tuberculosis has developed subsequent to an injury. Analysis of these cases shows while there has been coincidence, I have not been able to find any evidence of etiologic relation other than this coincidence.

It has been the experience of those writing on the subject that consumptives withstand operative procedure well. Amputations and other severe traumatizing operations are done without localization of the infection in the area operated on. It is the history of tuberculosis that sooner or later, in most instances, the bacteria find their way into the blood stream and an acute or sub-acute miliary tuberculosis results.

Recent observations tend to show that the bacilli find their way into the receptaculum chyli and thence by way of the thoracic duct into the blood stream. This route, rather than by ulceration through the blood vessel-wall. This pouring of bacilli into the blood stream is not persistent—it is intermittent—and tuberculous blood infection is found only at exceptional moments.

The teaching of pathology, then, is in keeping with clinical teaching—namely, that trauma has nothing to do with the generalizing of a tuberculosis which is primarily local in a lung or in a portion thereof.

I wish, however, to speak especially in regard to the relation of trauma to bone and joint tuberculosis. The conclusion that trauma is largely responsible for these forms of tuberculosis is founded in the main upon the observations of Max Schüller. This study was made in 1880, prior to the discovery of the tubercle bacillus. Injections were made with material containing other organisms, as well as tubercle bacilli, and as the laws of pathogenesis of these differ radically from those of tuberculosis, the conclusions adduced cannot be completely accepted.

Lannelongue and Achard (Bericht ü. d. Kongress z. Bekampf d. Tuberculose, Berlin, 1899) have made a very much more satisfactory study of this question, and arrive at practically opposite conclusions. They injected tubercle bacilli intravenously, subcutaneously, and intraperitoneally into guinea pigs and rabbits, and then traumatized their bones and joints. The technic and details of their experiments were sufficiently varied to warrant them in concluding that a single trauma would not determine the localization of tuberculosis even though virulent tubercle bacilli were circulating in the blood and locating in organs somewhere.

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The relation of trauma to localized tuberculosis is difficult to determine, because the disease is slow, so slow that the patient, as a rule, has forgotten the injury. When a patient with localized tuberculosis is questioned as to a history of injury his recollection is so inaccurate as to be misleading in the majority of cases.

This is the first reason for doubting the accuracy of the usually held opinion that traumatism develops tuberculosis. The second is that many cases diagnosed as bone and joint tuberculosis are infections with other bacteria. While experimental work has shown little tendency to determine localization of tuberculosis it has shown a tendency to localization of other infections.

Baer and Kennard *(Johns Hopkins Hospital Bulletin)* use tuberculin for diagnosis of bone and joint lesions. I cannot understand how any one can fail to use it. There is not the same difference in clinical characteristics between tuberculous bone and joint lesions and those due other bacteria that there is in soft tissues. (This of course, with the exception of acute osteomyelitis, and a few rapidly destructive forms, in which there is difficulty in excluding tuberculosis.)

The method is as follows: Dilute the tuberculin with 100 parts of a very weak (½-1 per cent) watery solution of carbolic acid. Inject 7 minims of this dilution hypodermically, 6 to 8 hours after begin taking the temperature and pulse every 2 hours. Record it—a rise of temperature to 101 when there had been no previous fever, a rise of pulse of 15 beats, and a general malaise and considerable soreness at the point of injection means tuberculosis. This temperature subsides in 12 hours, and the malaise is gone the next day. Such a reaction means with certainty that the lesion is tuberculous. All other diagnoses are guesses of varying degrees of shrewdness. Any bone or joint infection may be of slow progress, low febrile reaction, signs by which tuberculosis is usually determined.

Tuberculous infections of bones and joints are less frequent than pus infections. Jaffé says that 26 per cent of tuberculous bone lesions is in the vertebræ; 21 in the ankle; 13 in the hip; 10 in the knee; 9 in the hand, and 4 in the elbow. He states this is not the order of frequency of injury, and he concludes therefore, that injury is not a large factor.

DISCUSSION.

Dr. Hugo Philler, Waukesha, Wis.: I would like to ask a question for information: Does the essayist think the tuberculin test would be of any value in cases of mixed infection, where there is already fever, etc.? If a wound heals by first intention, or even by granulation without suppuration, I believe there is no call for the exhibition of tuberculin. I would go further and claim that tuberculin is not a reliable test, if it gives its specific reaction, even in cases of simple and primary wound healing, except there is somewhere in the system previous to the injury a focus of tubercle bacilli.

Dr. H. Reineking, Milwaukee: I am very glad this paper has come before the society. It is a subject that has interested me a great deal. Seven or eight years ago Dr. J. E. Owens, chief surgeon of the North-Western and Illinois Central railways, requested me to write a paper upon the subject of the relation of trauma to tuberculosis of the knee joint. At that time, after as much study as I could give to the subject, I came to exactly the same conclusions practically as those presented by Dr. Evans today. And it is of interest here to refer briefly to observations made at the clinic, for instance of Professor Koenig at Göttingen and the material collected during that period by Professor Orth, who was during that time professor of pathology at Göttingen. He found that in the fatal cases of bone and joint tuberculosis which came to post-mortem examination, there were present old foci of tuberculosis in about seven per cent of all cases, which shows that so far at least as the preceding tuberculosis is concerned the cases of joint and bone tuberculosis were always preceded by tuberculosis in other parts of the body. Of course, that has not much bearing upon the question of trauma, but I was interested in this subject particularly on account of having given it special study.

Dr. W. H. Baldwin, Memphis, Tenn.: It

has been our experience that the symptoms of pulmonary tuberculosis follow the convalescence from the majority of major and a good many of the minor injuries occurring in negroes of 18 to 40.

Dr. E. H. King, Muscatine, Iowa: A question arises in this connection in regard to trauma and pulmonary tuberculosis, to get the exact definition of trauma in this relation: Must we have contusion or laceration or some severe injury? If we get a cinder in the eye we say it is traumatism, but it is an injury to the eye, and we have certain conditions to which particular occupations subject people which essentially produce traumatism in the lungs. I refer to the steel grinders who inhale particles of emery; also men who work in dust, as coal miners, whose pulmonary tissues become impregnated with coal dust. This condition is essentially a traumatism, producing a source of irritation, not violent, but insidious and laying the foundation for a condition of lowered vitality when the tuberculous infection is present. Now, may not that be an inciting cause and have a direct relation to pulmonary tuberculosis?

Dr. A. B. Brumbaugh, Huntingdon, Pa.: Some time ago I listened to Dr. Woodhead of London, who talked on the subject of the paths of invasion of tuberculosis. Dr. Woodhead was on the Royal Commission for Investigation of Tuberculosis in the United Kingdom, and he came from London to deliver a lecture before the Phipps' Institute in Philadelphia. He had made the subject a study for many years, and he came to the conclusion that the paths of invasion of tuberculosis were through the lungs.

Now, if there is no relation between pulmonary tuberculosis and trauma, how are we to reconcile the fact that tuberculosis is found in the joints in the absence, in toto, of any relation to a pulmonary condition? Dr. Evans said through the sputum being swallowed into the stomach. The tubercle bacillus has a habitat and it will find its place in the system, migrating from point to point until its habitat is satisfied. Dr. Dixon, the Commissioner of Health of Pennsylvania, is purely of the opinion that tuberculosis in the stomach of one person communicated to another, even to the lungs, will not produce pulmonary tuberculosis, but it will produce gastric tuberculosis even though the bacillus may traverse the lungs, the liver, the spleen, or any other organ, until it finds its habitat.

Could it be possible, therefore, that the bacilli of tuberculosis might be found in a joint where there had been trauma—in the hand, the arm, the foot, the head, or any other part of the body—without having traversed the lung? I merely call this point up that the discussion may widen itself a little, because I know that unless we have been thinking about this subject of tuberculosis and trauma we do not have anything to say. I am a firm believer in the contagiousness of tuberculosis. I was the first one in the sanitary convention in Pennsylvania to assert my belief and give reasons for it, and I was ridiculed out of countenance. I told Dr. Woodhead this, and he asked me how long ago it was. "Twelve years," I replied, and he said, "We certainly do move." There are few sanitarians now who would deny that fact, I believe, although I have heard an adverse opinion expressed very recently.

Dr. H. B. Hemenway, Evanston, Ill.: I have been very much surprised at Dr. Evans' statement. In the first place we all know, of course, that tuberculosis is a germ disease, and even though you have plowed ground you cannot get corn unless you plant the corn. Therefore we must have the germ present in some way; but just as it is impossible to grow corn on a pavement, it is impossible to grow corn unless the ground is put in proper condition. So it has seemed to me practically impossible to get tuberculosis—either of joint or any other part—unless the soil is in proper condition.

How is this done? In the first place the lessened vitality. Now, we all know that as the result of an accident, the vitality of the individual is for the time being reduced, and the power of resistance to disease germs is therefore lessened; it is lessened not only as regards tuberculosis, but for other things. If in addition you have a local injury, as, for example, such a compression of the chest as to

rupture the pulmonary cells, there is a better chance for the tubercle bacillus to get in, and, further than that, immediately following the traumatism the cells are not normally active and the germ is not so easily put out, and it gets a nidus there where it may develop. I think we all have seen cases, for example, of traumatism of the knee (I will admit generally repeated traumatism), in which we cannot see that the condition absolutely results from traumatism, but following the traumatism we do get tuberculosis of the knee. I will grant that we ordinarily get a repeated traumatism. Why? If you have an injured knee, caused perhaps by a strain or blow, you are constantly using the leg, thus irritating the weak joint. And even after you attempt to have it entirely cured, the injury, which may not be of the knee itself, but near the knee, may have produced an abnormal sensitiveness of that particular joint.

I remember the case of a young man who injured his knee playing football. It got along so well that he thought it was all right; he strained it again a little, but did not think much about it. He wanted to go into the cavalry at the opening of the Spanish-American war, and after watching the examination a short time he came to me and asked if I could not fix it some way, as if he had to bend that diseased knee he might have difficulty; but he was thrown out. Afterward he was appointed to the Commissary Department at Chickamauga, but tuberculosis of the knee set in and he lingered along for some time, dying, I believe, of pulmonary tuberculosis. While admitting that, it does seem to me that the traumatism in that case did have some influence.

This question has a medicolegal bearing; are we willing to go on record and say that the traumatism has absolutely no relation to the tuberculosis. So far as I am concerned, I cannot convince myself that there is absolutely no relationship.

Dr. D. W. Beattie, Neligh, Neb.: About two years ago I undertook to inform myself as carefully as I could after reading several papers upon the subject, and I looked over my notes of the cases I had had, then I went to Omaha and investigated the case histories of the cases I could find in the Methodist and St. Joseph Hospitals and also in the Immanuel Hospital, and I felt I was borne out in the conclusion I had come to, which was this: That trauma had a relation to tuberculosis of joints, and that it was primarily a tuberculous ostitis.

If you will take almost any case of tuberculosis of bone and examine the patient carefully, you will find, in a large per cent of them at least, a history of trauma. The trauma may have been slight or it may have been considerable, but if you do get a history of trauma, you will find that the symptoms relative to trauma have all passed away and a definite period has elapsed before symptoms again occur, and you also find in the case of a child that the symptoms will recur earlier than in an adult.

I took particular pains to note the length of time after receipt of the trauma to the time when symptoms reappeared, and I found that in children it would be in from two to three and one-half weeks, while in adults the period would be five to seven weeks. Why should this be so? In the case of the long bones the injury is usually at the junction of the shaft with the epiphysis at the point where the capillaries loop upon themselves and the circulation is the slowest. There a little trauma produces a blood clot, just the same as anywhere else, the vitality of the tissues is reduced, and there is the point where the tubercle bacilli multiply more slowly than would the pus-producing kind. As it develops, why do we not get symptoms? It develops, and the symptoms we get are pressure symptoms. The invasion is in the direction of least resistance, and that is towards the joint.

I believe that in most of these cases we have a primary tuberculosis of the synovial membrane. Why? The infection reaches the mucus through the blood, and the synovial membrane has no blood supply except by imbibition; as it advances toward the joint and comes to the covering of the articular surface, that causes a pressure, and the symptoms are pressure symptoms. They come on slowly as compared with the symptoms of infection by the pus-producing

cocci, the temperature is not so high, at first at least, we get a stiffness of the joint in the morning which possibly passes off in a short time, and finally as it breaks through the joint we get the symptoms of a tuberculous arthritis.

Dr. Evans (closing): I trust you will pardon me for breaking into your accepted order, but I have to go before the city council at 3 o'clock and it is necessary I should get away. I should like to stay here and take part in all this tuberculosis discussion. You have heard of the Irishman who was never peaceful except when fighting, and so I like to participate in discussions on the subject of tuberculosis.

The points I want to make somewhat clearer than I evidently made them in my paper, are these: In the first place I am going to ask you to review the experiences that you have had in the light of a more accurate opinion that you might get from the use of tuberculin. There is no clinical sign or symptom of tuberculosis in bone or joint that is not had in pus infections of bone and joints at times. There is no pathologic appearance to the naked eye of infection with the tubercle bacillus, that is not had at times in infection of bone or joint with bacteria other than the tubercle bacillus. That which characterizes the tuberculous inflammation, microscopically and by its pathologic picture, is a something which comes from the relatively low degree of virulence of the tubercle bacillus, and consequently a relatively slow development of the tuberculous process, and other bacteria develop, varying in virulence just as does the tubercle bacillus, and therefore you get clinical pictures from other bacteria, you get gross pathologic pictures from other bacteria, and at times you get microscopic pictures from other bacteria, which cannot be differentiated by any man from the picture which is given by the tubercle bacillus.

Now, we have a means of differentiating with certainty between those inflammations due to the tubercle bacillus and those due to other organisms, and I ask those of you who are wedded to the opinion that trauma is responsible for the development of localized tuberculous lesions to recast that opinion in the light of evidence gained by this kind of investigation.

In regard to the technic of the tuberculin test, Dr. Philler has asked as to how we should weigh temperature prior to the time of injection. Your idea is this: If tuberculosis exists in a given case, as the result of injection of tuberculin there will be a reaction; that reaction will vary partly on temperature, it will vary partly on pulse, and let me say what perhaps most of you believe, possibly some do not, that in my judgment the reaction of the pulse to tuberculin and the reaction of the pulse to the poisons of the tubercle bacillus of whatever sort they may be, is more characteristic than is the reaction of temperature thereto. Therefore, if you get a rise in pulse, malaise, and some local irritation at the point of injection, you say you have a tuberculin reaction, that the patient is tuberculous. Now, it is customary to observe the patient for several days prior to the injection, the usual period of observation being three days—taking the temperature and pulse for three days prior to injection. The point is that there can be no hard and fast line as to this prior observation. I have injected a large number of people the first time I saw them; I elicited a history that there had been no previous fever, no previous malaise, and thinking that it would be impossible to hold the patient for some days of prior observation, and viewing the history as the patient gave it to me, I have felt safe in giving an injection of tuberculin, feeling certain that if there is no reaction there is no tuberculosis; feeling certain that if there is a reaction I can hold that patient for three days or three weeks if I wish for subsequent investigation. Nevertheless, it is a good rule to investigate the temperature and the pulse curve of your patient prior to giving the injection of tuberculin. Sometimes it is necessary to observe for three days, sometimes for only one day, and sometimes you must observe for two or three weeks. Where a patient is running temperature it is necessary to observe that patient until you are certain in your own mind as to what the range of temperature and pulse in that patient is without the use of tuberculin, and having made up your mind definitely and certainly as to what that range is, then give

your dose of tuberculin and see what the result is. The argument is in favor of studying each of these cases running temperature until your mind is made up as to what the range of temperature and pulse is without tuberculin.

With reference to mixed infection, we will say a patient is running a temperature of 100.5 and a pulse of 90; that case comes under your observation, you watch it along until certain what the range will be, and having determined as best you can what the range will be, give the injection of tuberculin and see what the range of temperature and pulse is. Now, you may say at once that it is impossible at times to know that you would not have had a rise of temperature from the septic infection, and that is true, gentlemen, and when you have septic cases of tuberculosis it requires very much more of individuality of study than it does in the other instance. But in my judgment, even in those cases the opinion that you get from such a procedure is superior to the opinion that you get from the accepted method of procedure at the present time. We have heard a great deal today about the question of resistance in its relation to localization of tuberculosis. There has been a good deal of study of that question without arriving at very much of a conclusion. I do not know of any question in medicine that has been so extensively fought over as the question of the reason for infection at the apex of the lung, and now after many years I do not believe we know any more about it than when we started.

Studies of a tubercle, especially in its relation to the development of blood-vessels, has shown that the tuberculous processes growing from these bacilli tend to the production of tissue with the obliteration of the adjacent blood-vessels. Occasionally a group of bacilli will liquefy its way into the blood-vessel, there is no question about that, but there is altogether a probability that before the bacilli have reached the interior of the blood-vessel the production of tissue will have completely obliterated the lumen of that vessel.

The more probable explanation is that which has come vividly to the fore in the last few years. Whipple, one of the observers at Johns Hopkins University, has studied the distribution of tubercle bacilli throughout the body, and he found that the man who had tuberculosis was swallowing tubercle bacilli, that they were finding their way into the thoracic duct, and that this was the way in which the bacilli were getting into the blood stream, rather than by direct extension into the adjacent blood-vessel. And this method of spreading from the lesion to the blood stream is so easy of explanation that the wonder occurs to us that it had not been the explanation of it a long time ago. It also explains the way in which waves of generalized tuberculosis advance and recede in the history of the disease of miliary tuberculosis.

Why the tubercle bacilli should locate in one organ of the body rather than in another organ of the body is something that is exceedingly difficult to understand. The reason for immunity, the reason there is so little of muscle localization as compared with other kinds of localization, the reason why in childhood tuberculosis is glandular whereas in adult life it is pulmonary—these are questions that we are not ready to solve at the present time. The idea that here is an area of lowered resistance is something that explains without in any degree explaining.

What constitutes lowered resistance? Since the work of these gentlemen who have been studying opsonins we have found that much of that which we formerly held to be true relating to lowered resistance is not true; we have found that these phases that were formerly accepted are not acceptable in the main. Now, I believe with some of the speakers—and as I said in my paper—that a nagging, continued irritation can localize tuberculosis just as it can and does localize pus cocci in a given area. But I do not believe there is any evidence at the present time that a single trauma, or one or two traumatic influences, has anything to do with the localization of a tuberculous process in a given area.

Gall stones become troublesome under two conditions: (1) when they migrate, and (2) when the main ducts and the gall bladder become infected with pathogenic microörganisms. —*Bland-Sutton.*

POST-TRAUMATIC APPENDICITIS.

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No organ or part of the body appears to escape the effects of trauma, and as the field for damage claims constantly widens, it very naturally follows that new foundations are laid from time to time upon which litigation may be based.

Within the last ten or fifteen years the prosecution of claim for personal injuries has become such an important professional industry that in the interest of fairness it has become necessary to inquire more and more closely into the logical causes of the diseases which are said to be related to injuries. The explanations based on chemical pathology have tended to clear up many obscure points in the production of disease, but if it has not relieved trauma of its share of responsibility it has made a fairer division of responsibility and served to fix more definitely when the influence of trauma ends.

It is so easy in cases where there is a history of an injury to assume that the influence of trauma never ceases and that for years after, cancer, tuberculosis, sclerosis and almost any variety of degenerative change may be expected to arise; in other words the clinician in tracing back the clinical history, at last reaches the somewhat poorly-remembered injury and at once finds in this the cause of disease—the locus minoris resistentiæ. The demands of a more exact and definite pathology has not been satisfied with this and insists that a closer investigation be made, with the result of finding certain chemical changes in the cells of the tissues and in the blood, have been responsible for tissue changes which form the bases of degeneration processes. Speculation as to the relation of trauma to remote tissue changes cannot be considered good evidence and is of but little value, but when the trauma and the apparent results are closely related in time of occurrence it may be difficult to separate the direct effects of the injury from what may be a mere coincidence. This is especially true when acute inflammatory process quickly follows in a part which has been subjected to an injury.

MM. Jeanbrau and Anglada, in a paper recently published in the *Revue de Chirurgie,* on "Traumatism and Appendicitis," starts with the following question: "A workingman receives a blow in the right iliac fossa or makes a violent effort, he is taken with an acute pain at McBurney's point and an appendicitis develops, the existence of which is verified by a surgical intervention or by autopsy, what rôle does the accident play?"

Without further investigation it would probably be conceded that the relation between the traumatic and the appendicitis was very clear. This would be the opinion of laymen generally, and of the medical profession to a considerable extent. If this relationship was granted the question would arrange itself under these heads: (1) Could a healthy appendix become inflamed by a blow on the abdomen or by a strain? (2) Could a latent disease of the appendix be excited into an active attack; (3) Could a chronic recurrent appendicitis be converted into an acute appendicitis?

To what extent the above proposition can be admitted or denied must depend on an analytical study of the cases of alleged appendicitis due to trauma of which a considerable number have been reported. The first paper written on this subject was by Neumann in 1900. He found that in 152 cases of appendicitis observed at the Halle Clinic, ten appeared to coincide with trauma. Upon these observations were based the following conclusions: (1) A direct or indirect traumatism could produce an appendicitis in an individual whose appendix was normal; (2) that in the majority of cases the appendix contained a calculus or foreign body; (3) that the calculus did not perforate all the walls of the appendix, only produced a laceration of the mucous membrane, which permitted the entrance of infection. In thirteen other cases collected from different sources Neumann found all but two to contain calculi, which were regarded as cases of calculous appendicitis of traumatic origin.

*Read at the fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

Previous to the publication of Neumann's paper, Stern, in his work on "The Traumatic Origin of Internal Diseases," reported some interesting statistics from Borchardt, who found three cases of traumatic appendicitis in 150 observations, and those of the Prussian army (1893-1894). In 533 cases thirteen times the disease appeared to be caused by a violent blow on the abdomen and seventeen times by violent efforts or abdominal strain without direct contusion. The evidence was dependent on the statements of the patient himself. Stern concluded after a consideration of these cases that it is not possible for traumatic appendicitis to develop in a healthy individual.

In opposition to the conclusions of Neumann, who contended for the comparative frequence of the traumatic origin of appendicitis. Erdheim in 1902, in a paper entitled "The Coincidence of Appendicitis with Traumatism," expressed himself to the effect that the cases of alleged traumatic appendicitis were only the acute crises of a latent appendicitis. He also intimated that a rigid inquiry into the previous history of the patient said to have an attack of traumatic appendicitis would reveal more or less evidences of vague abdominal troubles, as loss of appetite, nausea and vomiting. Erdheim stated in positive language, "In all cases in which we observe the symptoms of appendicitis immediately after a traumatism, we find either in the antecedents, or in the course of the operation proof that the appendix was already diseased before the accident." He concluded by saying that a "calculous appendix is a diseased organ and according to our conception of the pathology of appendicitis the calculi the products of an inflammation of the appendicular mucosa."

In France Jeanbrau and Anglada found but few observations recorded. These authors in examining the theses of d'Anghel, Dubarry, Mlle. Gordon, the articles by Jalaguier, Guinard, Degnen and Brun found several cases where traumatism was considered to have provoked an acute appendicitis.

The work of French writers upon the pathology of accidents to working men furnish some interesting facts in relation to the question of traumatic appendicitis. Ollive and Le Meignen after studying 2 cases by Brun of alleged traumatic appendicitis find they were not cases of appendicitis, but contusions of the abdomen with rupture of the appendix. In reviewing the published cases of alleged appendicitis these authors observe that in none of the cases could they find that changes in the integrity of the appendix were noted and in conclusion Ollive and Le Meignen say that the cases "were not cases of traumatic appendicitis, but appendicitis aggravated by traumatism."

A considerable number of cases of appendicitis have been reported as being caused by injuries to the abdomen the actual pathology of which have not been demonstrated by either operation or post-mortem. It would manifestly be of but little aid in elucidating this question to consider them. It would be impossible to determine the previous condition of the appendix or the complicating influence the trauma may exercise on the other organs of the abdomen. Of course it might be easy to assume that the symptoms following the blow on the abdomen were due to an inflammation of the appendix. In the absence of an exploration the diagnosis would be uncertain and the cases could not properly be used in support of a proposition which demands the best evidence. Therefore only the cases can be used which have been studied in a way to eliminate all doubt as to the real condition of the appendix and the adjacent organs.

MM. Jeanbrau and Anglada first consider the main question under two heads: 1st, Observations in which the accident determined an acute attack of appendicitis in persons having had previous attacks of the disease; 2d, observations on appendicitis caused by traumatism in persons whose antecedent history does not reveal a previous attack. It will be seen as we proceed that all pathologic and clinical evidence as determined by either operation or post-mortem examination will be grouped under the first division.

These authors in reviewing the histories of 43 cases of post-traumatic appendicitis found 24 were calculous, i. e., contained one or more calculi and 19 non-calculous; all these cases

had been submitted to operation or autopsy. Of the 19 non-calculous cases, 8 followed direct traumatism to the abdomen, and 11 strains or other accidents in which no direct violence was applied to the abdomen. Of the 24 calculous cases, 12 followed contusion of the abdomen and 12 accidents not involving abdominal contusions. In reference to the 19 cases of non-calculous post-operative appendicitis nearly all presented evidence of old adhesions which had in some degree been lacerated by the accident. In most of the cases there was a clear history of previous attacks while in others the history was obscure or negative.

It must be conceded from a pathologic point of view that the presence of old adhesions indicates a previous inflammation which while not marked by well defined symptoms must at some time have existed, leaving the appendix in an unhealthy condition, ready to become acutely inflamed on perhaps the slightest provocation by violence, either direct or indirect, which disturbs the adhesions or disturbs the diseased appendix itself. Every surgeon is familiar with a class of indirect symptoms the full significance of which are not fully understood until a most rigid analysis is made, and the appendicular origin are never recognized by the patient or his friends. So small a number of cases have been found without a distinct history of previous attacks that it is fair to assume that the history of the others have been overlooked, especially when adhesions are found. The presence of calculi or of other foreign bodies of itself presumes a diseased appendix and it can be readily understood that an accident may be sufficient to light up an attack.

This is seen in a case which came under my own observation a few years ago. A brakeman was standing in a way car near a table used by the conductor for writing; the table was firmly fixed. The train broke and the air was set, the rear half of the train stopped suddenly. He was thrown forward with considerable force, striking his abdomen in the region of the appendix against the corner of the table, other bruises occurred, but the chief complaint was pain in the right iliac region and he suffered somewhat from nausea. Remained in bed two weeks, the pain gradually disappeared; at the end of the two weeks he got up and about his room; in two days the pain and nausea returned, but subsided on returning to bed. This experience was repeated two or three times before he would consent to an operation for the removal of the appendix, which he was informed was diseased. A large appendix was found filled to distension with semi-fluid fecal matter. The appendix did not appear to be inflamed, only rigid from distension. It could be readily understood that the distended organ lying free over the cecum would become painful on pressure movements of the abdominal walls after having been exposed to a violent trauma confined to a limited area when the muscle walls were unprepared. The most rigid inquiry failed to reveal any previous history of an appendicular trouble.

To understand how the appendix can be contused, the body must be of small volume and the contusion must be violent as by a bar of iron or a broom stick, or the corner of the table, as in the case observed by myself. To affect a normal appendix the violence must be very great, for it floats freely among the intestines which envelope it like an air-pad which breaks the shock.

Experimental evidence has been offered in support of the contention that trauma may contribute to the inflammation of a healthy appendix. Beaussenat exposed the appendix of a series of rabbits and injected them with cultures of the colon bacillus, at the same time traumatising the mucous membrane, all these animals developed suppurative appendicitis. In another series he injected the appendices with cultures of the colon bacillus; six days later the appendices were again exposed and bruised; during this interval no change in the organ had taken place. On the fourteenth day the rabbits were killed, no lesion was found. In still another experiment Beaussenat first traumatised the appendix and five days later injected it with a culture of colon bacillus. The animal destroyed six days later showed a gangrenous ulcer in the appendix. In the second experiment when the appendix was first injected with the colon bacillus and six days later traumatised without results, it was held that the bacteria had lost their virulence.

However interesting these experiments may be, it would seem the objection of Jeanbrau and Anglada, that they are of but little clinical value in interpreting the part played by trauma in producing an inflamed appendix infected by the colon bacillus, staphylococci or streptococci was well and logically, taken especially as it is not possible to compare the influence of a shock or blow on the abdomen or a strain with the "double action of bruising the appendicular mucosa with the fingers and the injection of 100 cc. of a pure culture of colon bacillus."

Brun reported two cases in children where a blow on the abdomen produced a rupture of the appendix. The appendix was divided in the middle into two parts which were joined together only by a shred of healthy tissue. These two cases should be grouped with lesion of the intestines from contusions of the abdomen and not with an appendicitis which involves altogether different conditions. In most of the reported cases of alleged traumatic appendicitis in which the appendix is assumed to have been healthy with recorded post-mortem or operative observations no mention is made of the absence of adhesions or a history of the patient's antecedents as illustrated in the case of M. Guinard:

A young man of 26 was kicked in the right iliac fossa by a horse. He had, following this successive attacks of appendicitis. Two years later was operated. The appendix was swollen, congested and rigid, its mucosa swollen and ecchymotic. No mention was made as to previous symptoms of appendicular disease. In the same class comes the observation of M. Legueu, a child was kicked with great violence in the abdomen, followed on the next day by peritonitis. Operation showed a perforation of the appendix. Also the observations of Moty: A soldier was thrown from a carriage, falling on his right flank; was in bed a month, suffered acute pain on pressure in McBurney's point. Laparotomy four years later, the appendix was doubled on itself, adherent to the external surface of the cœcum, its canal obliterated and distal end atrophic.

These cases are considered from the standpoint of direct cause and effect without reference to possible antecedent conditions, and are offered as examples of traumatic appendicitis in a previously normal appendix. The facts are not sufficient or complete and do not satisfactorily sustain the contentions of the authors.

In nearly all non-calculous cases of post-traumatic appendicitis no mention is made of suspected previous attacks, or of previous conditions of the organ, and it therefore seems fair to assume that they all belong to the same class, and that proper inquiry would have shown conclusively that direct trauma or strain could only cause a post-traumatic appendicitis when the appendix was already diseased.

Referring to the 24 cases of calculous appendicitis included in the collection of Jeanbrau and Anglada we may include all foreign bodies of whatever kind found in the appendix. It can be conceived that a severe blow in the right iliac fossa may contuse the appendix even to forcing the body through its walls or at least to traumatise the mucosa and establish thereby a focus for infection and a consecutive acute appendicitis. Post-traumatic inflammations of the appendix of the peritoneum in the class of cases including foreign bodies cannot be considered as true primary appendicitis for the organ may be regarded as already diseased and it only requires some force direct or indirect to light up an active inflammation, a strain at stool, active muscular exertion may be sufficient.

Delorme has shown that it is not necessary that the blow on the abdomen be directly over the appendix, and reports a case of a kick of a horse in the umbilical region which induced a diffuse peritonitis. Post-mortem revealed a perforation at the base of the appendix and on the side of the appendix where the perforation occurred the wall was very thin. In the interior of the organ was found a soft friable calculus. Delorme's interpretation of the facts in this case was that the gas and liquid contents of the intestines was propelled so actively in the direction of the appendix that the previously attenuated walls were ruptured by the pressure.

The conclusions to be reached after a consideration of the clinical and pathologic evidence thus far offered are:

First: That a blow upon the abdomen or a

strain do not produce an appendicitis in an organ previously normal.

Second: If an appendix already diseased contains a foreign body, is deformed, or held by adhesions, a trauma to the abdomen or a strain may determine an acute attack of appendicitis.

Third: It is shown that a direct injury to the abdomen or the indirect force of a strain are about equally productive of acute attacks in previously diseased appendices.

TRAUMATIC APPENDICITIS, WITH REPORT OF A CASE.*

P. E. SAWYER, M. D., SIOUX CITY, IOWA.

In response to an invitation to present a subject at this meeting for your discussion, I have endeavored to select one which would be of interest, not only to the railway surgeon, but also to the claim department of the different railroads.

The subject of Traumatic Appendicitis was determined upon—not because of having discovered anything new either in literature or in my own experience—both being rather limited in regard to traumatic appendicitis,—but on account of my desire to report the following case which was interesting, not only from a surgical—but also from a medico-legal point of view.

CASE.

Miss F., age 22, accompanied by her sister, was returning to her home from some point in Nebraska when the train upon which she was a passenger, while going at the rate of about 10 miles per hour, left the rails, throwing her violently forward upon the seat directly in front of her.

When the train arrived at Sioux City, about six hours later, she was suffering severe abdominal pain, was taken in a carriage to a surgeon's office, who, upon making an examination, declared her to be suffering from appendicitis and advised an immediate operation. She was taken at once to St. Joseph's Hospital, but at this point her parents stepped in and refused to give their consent to the operation, notwithstanding that the surgeon (as I afterward learned) assured them the expenses would have to be borne by the railroad company upon whose train she was injured.

At the expiration of about three weeks she left the hospital for her home. The following day she again developed severe abdominal pain, and I was called in consultation with her family physician, the surgeon who saw her first having been discharged.

Her trouble was appendicular beyond question and an immediate operation was advised and performed at St. Joseph's Hospital the following morning. A chronically inflamed appendix, the mobility of which was more or less impaired by adhesions, was removed, and the patient made an uneventful recovery.

I heard nothing further from the case until about six months later, when the mother of the young lady came to my office and informed me that she had consulted an attorney in regard to her daughter's injury upon the train. This was the first time that I had thought of the derailment of the train and the appendicular trouble in connection with each other.

After thinking it over carefully, I considered it unsafe for an attorney to get mixed up in the case, and advised her, before giving the case to a lawyer, to write the claim department of the road involved, explaining the case from the date of the accident to the present time; also the condition of her daughter's health prior to the accident; and if the company thought they were in debt to her in the least, she would doubtless hear from them at once.

A few days later a claim agent called upon her, and then came to my office. I told him the condition the young lady was in when I first saw her, and the result of the operation, which clearly indicated previous appendicular inflammation. He spent several days in looking up the case, and among other things discovered that the young lady had told a nurse while at the hospital, that she had had this same trouble before, and thought she would probably be able to get along, as she had previously done, without an operation.

The agent told me afterwards that he had worked up what he considered a "stone-wall"

*Read at fourth annual meeting of American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

defense, but upon presenting it to the general claim department was told to go back and make a satisfactory settlement with the family if possible.

The view taken by the claim department, I should imagine, was this: That the young lady, as far as they could discover, was in good health when she got on the train that morning, and continued so on up to the time of the wreck. After that time she suffered more or less severe abdominal pains until her appendix was removed, which, while it exhibited positive evidence of previous disease, was not causing her any trouble on the day of the wreck, and it is impossible to say when, if ever, the diseased condition would have caused her trouble had she not suffered the trauma or strain incident to being thrown rather violently from her seat.

The agent made a satisfactory settlement with the young lady and I have since lost sight of her.

In taking up the subject of traumatic appendicitis, I wish to say that I do not believe there is any such thing as primary traumatic appendicitis. Located as the appendix is, in the right iliac fossa, surrounded by coils of small intestine, it is absolutely essential, if trauma is to play an active part in the etiology of any inflammation which may attack it, that its resistance should be weakened, either by some foreign body occupying its lumen, or by some prior diseased condition which would result in adhesions limiting its mobility.

In examining the literature I have discovered but one surgeon who believes that trauma will produce appendicitis in a perfectly normal appendix. I do not mean to say that there are not others having the same opinion as Dr. Black, but I have not found their reports in literature, and so can not quote them.

Dr. Black, in his most excellent paper on Traumatic Appendicitis, states that trauma will produce primary appendicular inflammation in a normal appendix, and makes the statement that Howard Kelly, with little effort, collected 50 cases occurring in the same manner. I am sure that he did not mean just what he said in regard to this statement, as following an analysis of these cases, Kelly states so far as he is able to discover, no case has appeared in which it has been shown that an external injury has produced appendicitis in a perfectly normal appendix; and from the following analysis of these cases it is apparent that the appendicular inflammation produced by trauma was not primary but secondary. In all he collected 50 cases of appendicitis resulting from trauma, or strain, and of these 41 occurred in males and 9 in females. In 26 cases the symptoms were severe at the onset; mild in 12, and severe symptoms were followed by interval and recurrence in 12.

Following the receipt of the injury, the symptoms developed in from a few moments to several hours in 37 cases, and in the other 13 in from one or two days to two years.

Foreign bodies were found in 30 cases; adhesions in 7; flexion in 1; cyst in 1; and 1 was abnormal in size. In 10 cases the findings were not noted.

Dr. Deaver, in an analysis of 130 cases, states that in 101 the appendix was reported abnormal in some particular, while in 29 the findings at the time of the operation were not noted.

From the above analysis it seems very improbable that trauma or strain would produce any effect upon a perfectly normal appendix.

Whenever an appendix does become the seat of an active inflammation resulting from a trauma or strain, then the medico-legal aspect of the case becomes of interest to all those directly or indirectly connected with the case.

If you will pardon me for mixing law with surgery, I would like to quote a few lines from "The American and English Encyclopedia of Law" (2d Edition, Volume VII). The article on Contributory Negligence is as follows:

"1. *Defendant's negligence causing or aggravating disease.* In cases when the defendant's negligence caused a disease, developed a latent tendency to disease, aggravated a prior disease, the defendant must respond in damages for such part of the diseased condition as his negligence caused. And if there can be no apportionment; or if it can not be said that the disease would have existed apart from the injury inflicted by the defendant, then the defendant is responsible for the diseased condition."

And in section 4: *"Diseased condition must be traced to injury.* But it would seem that a carrier should not be held liable for a diseased condition when it can not be told whether the condition is in any manner attributable to the negligence of the carrier, or wholly arises from other causes. In other words, the plaintiff must show, by a preponderance of the evidence that his disease is due, wholly or in part, to the negligence of the defendant, and this he does not do if the evidence shows another probable efficient cause of the condition, without showing that such other probable cause was not really the efficient immediate cause thereof; and subsequently developed disease, apparently following from the defendant's negligence, must be shown to be due to some other cause, or the defendant's negligence will be held the proximate cause of the condition."

Thus it is seen—as Deaver states in his article on "Traumatism an Etiologic Factor in Appendicitis"—

"That the question of negligence enters into the subject to such an extent that if the defendant can prove the plaintiff was conscious of the fact that he had had appendicitis, and that he had been advised by a surgeon to have an operation for its removal, he would be unable to collect damages under the clause of 'Injury enhanced by Disease.' On the other hand, if the patient had a previous disease of the appendix, without any knowledge on his part of the existing condition, then the question of contributory negligence on his part could not be raised."

In closing this rather brief and imperfect paper, I wish to urge:

1st. For the protection of the railroad company, the patient, and ourselves, that we get as soon as possible following the injury a complete statement of the patient's history before his or her mind is warped by the interference of some member of the legal profession.

2d. That we find out the agent causing the injury, the manner in which the injury was produced, and the exact spot upon the body receiving the blow, should the injury be due to a blow. And,

3d. Should an operation be decided upon, make a careful notation of the exact condition of the viscera underlying the point which was said to have received the injury, and note carefully the presence or absence of concretions, adhesions, recent or old, or anything else about the appendix which would be abnormal or capable of producing the existing symptoms aside from the alleged injury.

DISCUSSION.

Dr. A. J. Ochsner, Chicago: These excellent papers are, I believe, quite in order and quite in time. The subject of the traumatic origin of appendicitis is coming more and more to the foreground, not so much from the clinical findings as from the fact that the legal profession is becoming educated in this portion of surgery. That a traumatism sufficient to cause an inflammation of the appendix is possible can, of course, not be doubted. In my personal experience I have seen an appendicitis caused by a gunshot wound, the bullet causing a destruction of the mesentery of the appendix, which, of course, left the organ without a sufficient amount of nutrition. Some time ago I would have said it was impossible for such a thing to happen, but the fact is it has happened.

On the other hand, among the cases of appendicitis that I have had to treat, there have been several (I did not look up the exact number, because I had not the time to go through all of the histories) in which there was an undoubted history of traumatism immediately preceding an acute attack of appendicitis. Among these there were several cases in which the question of liability was taken into account. For instance, a party in sliding down hill had a mix-up, one, a little boy, who came out at the bottom, developed a violent appendicitis immediately after the injury and during the attack I removed a gangrenous appendix. The boy had been in school for a number of weeks before this, yet the day this happened there had been absolutely no symptoms indicating that the child was suffering from appendicitis at the time this injury occurred, but the appendix was full of hard, fecal concretions, and a number of months before this the child had had an attack of pain in the region of the stomach, his stomach had been upset and he vomited, and it was supposed that he was suffering an acute indigestion. As a matter of fact we know from that history that the boy had had an attack of appendicitis which did

not develop into a destructive appendicitis, and that the attack later on was due to the crushing of the appendix, which contained a lot of granulating tissue and septic material. So that this case would belong to a class described by the two authors of the papers which we have just heard. However, even in a case of this kind it might be a coincidence.

I have in another instance operated upon a case of gangrenous appendicitis in a patient in whom an abortion was performed the day previously. It was supposed that the abortionist had injected some septic material through the uterus and that this passed through the right Fallopian tube into the peritoneal cavity, and that the patient was suffering from a direct infection due to this injection into the uterus. I opened the peritoneal cavity within twenty-four hours after this accident. I believe the accident happened at 4 o'clock, and she had the attack before she got home from the abortionist's operating-room. I opened the peritoneal cavity in the hope of removing the infected tube, draining the cavity and saving the patient from septic peritonitis, and to my astonishment I found acute gangrenous appendicitis. I have had another case in which the symptoms were those of a rupture extra-uterine pregnancy and in which I found also, besides the rupture extra-uterine pregnancy, a gangrenous appendicitis.

Consequently, having had cases with those histories, and, I might repeat, getting similar histories from the literature of appendicitis, in which there could be absolutely no relation between the traumatism produced by abortion and the gangrenous appendicitis or between the ruptured extra-uterine pregnancy and the gangrenous appendicitis, the matter must be one of coincidence absolutely. Judging from this there must be in traumatic appendicitis a very large proportion of coincidences.

Personally I have never encountered a traumatic appendicitis in any case in which there was not elicited a history of previous appendicitis. I have never encountered a case of traumatic appendicitis in which there was not at the time of the operation evidences of the person's having had appendicitis previously. So I would confirm the conclusions which Dr. Fairchild expresses in his paper, absolutely; I believe that we can properly confirm every one of those conclusions. I am sure that in my own experience the findings will thoroughly bear out all that these conclusions would indicate.

I believe, also, that the suggestions made by Dr. Sawyer in reference to these cases is a most excellent one. An enormous amount of trouble can be saved the patient if an accurate history is taken so the patient knows exactly where he stands. The attributing the entire appendicitis to traumatism I believe is wrong. I doubt whether the adverse conclusions would hold. Certainly from a legal standpoint they are correct, but it seems to me as though it would lead us too far to virtually compel every person having a grumbling appendix to have it out, or carry the whole injury in case of a traumatism.

Dr. A. B. Brumbaugh, Huntington, Pa.: In view of the small number of cases that were reported in the papers, it might be very interesting to this Association if Dr. Ochsner—inasmuch as he said that he thinks he never had a case of appendicitis that was directly due to trauma—would tell us something about the number of cases that have come under his observation. I think I heard him say at Saratoga Springs that it took him fourteen months to record 408 cases; therefore if his record has been as great since it must be quite a number.

Dr. Ochsner: I would say that the number of cases of appendicitis on which I have operated at the Augustana Hospital is somewhat over 3,300 cases all told. I have not the number of operations at the other hospitals, because many of them were complicated cases, the histories of which so far as the appendicitis was concerned were not kept, the appendix being removed incidentally. Of those 3,300 cases there is less than 1-3 of 1 per cent of cases in which there seemed to be any relation whatever between traumatism and appendicitis—I think about 9 cases, although I did not take time to look them up specifically.

Dr. E. S. McDonald, Cameron, Mo.: After hearing the able papers that have been read and the discussion by one who has had such a large

experience as has Dr. Ochsner, one who has had but a limited experience feels somewhat timid; and yet we must not acknowledge that we do not know anything about those cases, because we have to deal with them. I was just thinking that a traumatic appendicitis *per se* must rarely occur indeed, and is a question that is interesting not only from a medico-legal standpoint, but from the standpoint of surgery. The very fact that nature has protected this organ so wisely and wonderfully well renders it almost impossible to produce an injury upon it, being attached to a hollow tube that offers but little resistance to external force. I cannot see how we could have a primary traumatic appendicitis without a penetrating wound, and in all those cases that were reported it is not positively stated that they were traumatic—they were incidental, perhaps; the appendicitis was coincidental with the trauma. Therefore we cannot say positively that they were traumatic cases.

In regard to receiving the traumatic wound on the abdomen and there resulting soon after an appendicitis does not disprove the hypothesis that there might have been some concretion of fecal matter that had entered the lumen of the appendix days or weeks prior thereto and had set up the inflammatory process at about the time the injury was received. Therefore I do not incline to the belief that we have primary traumatic appendicitis.

Dr. J. D. Milligan, Pittsburg, Pa.: I have several cases I would like to report. On the 15th of February I was called to see one of our firemen who had been taken to the hospital. He slipped on the apron of the engine and was suffering from what was found to be perforation of the appendix. The amount of adhesions around the appendix was proof that it was not a primary appendicitis caused by the accident. The next case occurred on July 6th. Another fireman, strange to say, was suddenly doubled up while in the act of shoveling coal, fell forward against the handle of the shovel and was brought to the hospital within twenty-four hours afterwards, and, of course, the presumption was he had traumatic appendicitis. The appendix was gangrenous, but the old adhesions were proof of prior trouble.

In my experience, which, while not extensive, has not been limited, I have never found a case of traumatic appendicitis, and I do not believe such exists unless due to a stab or bullet wound, or some cause that cuts off circulation with the meso-appendix, and producing conditions of that character. We have very serious conditions arising within twenty-four hours, but it is not until you find a perforation or gangrenous appendix within twenty-four hours after the patient complains of the first symptoms.

Dr. E. J. Waddey, Waterloo, Iowa: Several years ago, before I knew much about appendiceal troubles (not indicating by that that I presume to know anything like all of it yet), I was called at noon to see a child of 7 years of age near my home. The history was that the patient had lifted her little sister, and immediately she had been taken with pain in the abdomen, I think not referable to the appendiceal region, but probably the stomach. The diagnosis was not entirely clear, although she gave the history of having had some trouble for three years prior. I operated on that child within twenty-four hours from the time this occurred, and found the peritoneal fluid beginning to color. The appendix was free, no adhesions, and did not seem inflamed, and I with my assistant wondered where the trouble came from. We took the appendix off and on examining it found it had a pin-hole perforation. Evidently there was an ulceration of the mucous coat of the appendix, and on lifting the child, with nothing but the peritoneal tissue left it broke through. This has no relation to any railway accident, but it was to me an interesting case.

Dr. Sawyer (closing): I have only a word to say. It seems to be the universal opinion of those present that there is not any such thing as traumatic appendicitis in a normal appendix, which I think is correct; that it is secondary always, and there is only one thing: While traumatic appendicitis as we understand it is, of course, important medico-legally, it is also very important from a surgical standpoint, for the reason that we have in nearly all of these cases such acute symptoms that if the patient is not given the benefit of immedi-

ate surgical treatment the results will probably be disastrous. So from that standpoint it is an exceedingly important surgical subject.

Dr. W. S. Hoy, Wellston, Ohio: There is one point upon which this Association would, I believe, like to be posted, because it is of medico-legal interest to us: When asked on the witness stand, "Could this man have a case of traumatic appendicitis?" are we justified in making answer to that question?

Dr. Sawyer: I believe the paper answers that question. I think I made the statement from my own observations and also from the standpoint of the literature on the subject, there is no such thing as primary traumatic appendicitis, that the appendix is diseased in some particular.

Dr. Ochsner (closing): I think there is nothing to add, except to affirm that so far as my experience and investigations are concerned primary appendicitis of a traumatic origin does not occur; that secondary appendicitis of a traumatic origin, that is, the traumatism lighting up a latent appendicitis, has repeatedly occurred.

THE INFLUENCE OF TRAUMA IN LOCALIZING INFECTION IN THE NATURAL MUCOUS CAVITIES OF THE BODY.*

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The natural mucous cavities of the body harbor infection, and give rise to disease which has generally been named after the cavity infected. Thus we have mastoiditis, frontal sinusitis, cholecystitis, appendicitis, pyelitis, not to mention a dozen others. These diseases are so well recognized and their significance and surgical treatment so thoroughly established that it leaves nothing for me to say.

The pathologic essentials of infection of any one of these cavities is the presence of pathologic germs in the secretions of the cavities, and an obstruction of the outlet. Without both of these conditions there is no infection and no disease. The character of the disease depends upon the character of the infection, but equally upon the completeness and permanence, or the incompleteness and interrupted character of the obstruction. If the outlet is open the infection easily disappears through the increased secretion of the mucosa of the cavity and the increased resistance which the continuance of the infection almost invariably breeds.

It is fashionable now to refer this resistance to the antibodies and the opsonins. Be that as it may, recovery takes place not at all, or incompletely, as long as the exit from the mucous cavity is obstructed.

The obstruction of a mucous cavity may be partial, incomplete, interrupted, or it may be complete and permanent. The course and symptoms of the disease are dependent upon the character of the obstruction, as well as upon the malignancy or mildness of the microorganisms within. The causes of obstruction of a mucous cavity are many. They may be classed as congenital defects, as the result of disease, or as the following of some injury. This injury may be thermal, it may be chemical, or it may be traumatic.

It is my purpose only to consider the effects of traumatic injury in initiating an infection in any of the mucous cavities of the body. It is well recognized that fracture of the base of the skull is frequently followed by infection of the mastoid. If we assume that the patient had an absolutely sterile mastoid and middle ear, we must presume the ingress of the infection through the ruptured drumhead. If we presume that the middle ear and mastoid have been previously infected, we have a right to asssume that the injury caused such an obstruction, and the discharge of the infected mucus has resulted in its retention and the initiation of the mastoid disease.

Every case of injury in the region of the temporal bone is apt to obstruct the outlet from the mastoid as well as into the middle ear, and precipitate a suppuration in this appendage of the pharynx. The same may be said of the frontal sinus, the ethmoidal sinus, and the sphenoidal sinus.

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Injuries of the base of the skull may precipitate disease in these cavities by deforming or obliterating the outlet from these mucous cavities. That this occurs so frequently in the face and skull depends not only upon the extremely complicated outlets from these cavities, but also upon the fact that these outlets are surrounded by bone, and the union of a fractured bone is attended by the production of a considerable callus. This is especially noticeable in relation to the frontal and ethmoidal sinuses. Blows and injuries here are followed years afterward by the onset of a sinusitis. In the abdomen we are acustomed to look upon disease of the gall-bladder and appendix as only slightly related to trauma. We recognize rupture of the gall-bladder, rupture of the cystic duct, rupture of the common duct, and we know what to expect and how to treat these conditions. But we are rather careless of less serious injuries of the gall-bladder. Cholecystitis is a disease that we think we understand. We generally look into the history of the case for an antecedent typhoid, and consider the gallstones resulting from the typhoid infection as the cause of a subsequent suppurative cholecystitis. In many cases, however, these etiologic factors are absent. If we consult the memory of the patient carefully, we find that there is a history of a fall, a blow, or some injury to the upper part of the abdomen, which was followed by transient, though possibly severe, symptoms, and then by twenty years of interrupted gall-bladder disease.

Let me recount a case which is significant, though not as simple as I could wish:

Mr. H., when 52 years old, was cutting a strip of wood on a circular saw, and by some mischance the two-foot-long strip was hit by the saw and thrown violently against the right side of his abdomen, just below the cartilages. The injury was so severe that he was unable to move for a few minutes, and then went home in a crouched attitude. He was obliged to remain in the house for three or four days before he went back to his work. He had never had typhoid or any sickness that kept him in bed, even twenty-four hours, during his whole life. He attached little significance to this injury, but following it he had a great deal of trouble with his stomach. His food did not agree; he frequently had eructations and regurgitations of food, with occasional vomiting. Twelve years later, while making a visit in California, he was taken with such a violent pain that morphin was necessary. He assumed a very much flexed attitude during these attacks of pain, keeping his knees and chest together, and seemed to get relief from hot applications over the abdomen. He vomited repeatedly, and at last recovered with a slight jaundice. Four years later, after eating a large dinner, he had a second attack, which left him with an extremely tender gall-bladder region. I saw him two days after this attack and made the diagnosis of cholecystitis. A few weeks later he had a third attack, which was attended by very acute nephritis. Following this attack he was under my observation until the urinary secretions slowly came back to the normal. I then insisted upon the drainage of the gall-bladder. A single stone was found in the cystic duct, and the patient recovered, to die of apoplexy several years later. The interior of the gallstone appeared to be a dark mass, similar to the residue of a blood clot.

This injury appears to me to have been the cause of the cholecystitis, which nearly ended the man's life by an acute toxic nephritis. If this injury had been subject to indemnity, a very small amount would have been attached to it, unless the possibility of such a serious following was adequately considered.

Trauma is looked upon as the cause of the onset of appendicitis in a small number of cases. The attack begins immediately after jumping from a car, from a swing, or after some unusual exertion or blow. The relation between the trauma and the onset of the attack is obvious, and is looked upon frequently as the actual cause of the disease. The matter has occasionally become the subject of legal investigation, and physicians have testified that the appendicitis was in the nature of an accident; thus an accident policy might be held liable for indemnity in a case of appendicitis which came on immediately after being thrown from a buggy, from a horse, or from any high place.

When we consider the importance of an obstruction at the valve of Gerlach as a factor in initiating this disease, we can readily see that injuries of the appendix, too slight to produce any immediate effect, might still be ade-

quate to obstruct the valve and prepare for its complete obliteration and the onset of an attack. Constant cough in tuberculous patients is a source of irritation of the valve of Gerlach which accounts for the unusual frequency of appendicitis in tuberculous subjects. The same thing occurs in whooping cough, and also in patients who jump the rope excessively, or run and jump from high places. It is probable that the presence of a right-sided hernia is a prolific cause of deformity at the valve of Gerlach and the initiation of infection. Blows upon the abdomen, injuries under rollers and wagon wheels, and by the falling in of earth might reasonably be looked upon as likely to be followed by a chronic and growing deformity of the outlet of the appendix.

Any injury of the ureter, either by fracture of the pelvis or by rupture of the kidney, must be looked upon as a possible cause of delayed obstruction of the ureter and infection of the kidney, or one of its calices. If a patient recovers of rupture of the kidney and is sound for a few months it is no guarantee that he will not subsequently suffer of a partial pyonephrosis. In operating for complete or partial pyonephrosis, I have on two occasions discovered evidence of injury in that neighborhood which was not elicited by the history. The rib was found broken in one case, and in the other case so displaced as to be at right angles to the other ribs. Even after the operation the patient could give no clear account of the cause of these fractures.

Injury of the urethra by falling on the pommel of the saddle or upon a fence is a well-recognized cause of stricture of the urethra and subsequent urinary cystitis, and even pyonephrosis. Such an injury as this is far less serious as producing extravasation of the urine than it is in initiating an obstruction in the outlet of the bladder and a delayed cystitis.

It must not be forgotten that in all of these cases the traumatic insult is quickly followed by infection of the abraded surface, but in every case the trauma is a primary cause of the essential element in the disease, and should be looked upon more often as a factor in the anamnesis.

THE RELATION OF TRAUMATISM TO THE ETIOLOGY OF APPENDICITIS.*

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Up to the present time there is no direct evidence to show that traumatism has caused appendicitis in an appendix which, prior to the injury, was perfectly sound and *normal*. On the other hand, there is an abundant evidence that traumatism is frequently the cause of onset of acute appendicitis in previously *abnormal* appendices.

I regard it of very great importance to the members of this Association and to the railroad company that we be able to clearly define the relation of injury to the etiology of appendicitis. I shall attempt, therefore, to show briefly in this paper the present state of medical opinion upon this subject:

HOW FREQUENTLY IS TRAUMATISM THE EXCITING CAUSE OF APPENDICITIS?

Previous to the year 1886, when Fitz of Boston published his observations which furnished the rational basis for our knowledge of appendicitis, writings upon this subject were not at all clear. Though, even as far back as 1837, there was in the minds of some surgeons a firm conviction that a relationship existed between inflammations in the lower abdomen and injury, it was not until several years after Dr. Fitz's very complete paper that this relationship began to be definitely understood and to be recognized as being at all frequent.

In a series of 257 cases of appendicitis observed by Dr. Fitz, traumatism was recognized as a causative factor in 29 cases. On the other hand, so eminent an authority as Fowler in his monograph published in 1894 states that he had not observed a single case where there was a definite relationship between the injury and the onset of the attack. Since 1894 surgical opinion has become practically unanimous,

*Read before the fifth annual meeting of the Association of Seaboard Air Line Surgeons, Jamestown Exposition, September 10-13, 1907.

however. Most recent writers, notably, Kelly, Deaver, Osler, Southey, Finney, and many others, have shown beyond the possibility of a doubt that injuries, even comparatively slight in degree, may bring on an attack of acute appendicitis.

The exact percentage of cases which originate as the result of traumatism is difficult to estimate. Hartley believes that 10 per cent of all cases of acute appendicitis are occasioned by injury. As already stated, Fitz reported 19 cases in a series of 257, in which the attack was supposed to be due to indirect violence. Osler gives no figures, but states that "trauma plays a very definite rôle and in a number of cases the symptoms follow very closely a fall or blow." Kelly collected 50 cases without difficulty from recent literature, but gives no percentage figures. Deaver in a recent complete article on the subject is inclined to the conviction that a much larger percentage of acute appendiceal attacks follow trauma than the literature would indicate.

In the practice of Dr. G. R. Holden, my partner, and myself in Jacksonville, Florida, since we have inquired definitely in all cases into the possible history of trauma, we have found *in a series of 51 cases* coming to operation since January 1, 1906, 4 in which we have concluded that the onset was due to traumatism. In several others there is a very strong impression in my mind that the attack was occasioned by trauma.

In two instances I have operated upon locomotive engineers who attributed their attacks to straining while reversing the lever of the engine. In three other instances (not included in our series of 51 cases), the onset of the attack was during a railroad journey, and was, in all probability, brought on by the jolting of the car. Many of you will recall that the late G. R. Fowler, whose book on appendicitis is entitled to a high place, was himself taken fatally ill with appendicitis while on the train from New York to Albany.

PREDISPOSING LESIONS.

While we cannot deny the possibility of an appendix being ruptured by direct violence, up to this time no case has been recorded, in which in a previously normal appendix, external injury has been shown to be the cause of the attack. If then we may assume that traumatism does not produce appendicitis in a normal appendix, what morbid conditions do we find to exist previously, with or without symptoms, which will account for injury becoming the exciting cause of an attack? The following have been noted as predisposing lesions:

1. Foreign bodies, that is, concretions, etc.
2. Adhesions, kinks, and constrictions.
3. Cystic distension.
4. Ulceration.
5. Abnormal size or position.
6. Acute infectious diseases, especially influenza.

It would lead us too far astray to take up here in detail the manner in which each of these predisposing lesions may prepare the way for acute inflammation of the appendix. Suffice it to say that, in the experience of all surgeons who have recorded their observations along this line, foreign bodies have been the contributing cause in by far the greater number of instances. In the 50 cases of "traumatic appendicitis" collected by Kelly ("The Vermiform Appendix and Its Diseases"—page 796), foreign bodies were found to be the contributing cause in 30 cases. Other morbid conditions occurred as follows: Adhesions, 7 cases; flexion, 1 case; abnormal size, 1 case; cystic appendix, 1 case. Definite morbid condition not noted in 10 cases.

As regards acute infectious diseases, there seems to be evidence that the intestinal form of influenza, in particular, predisposes to acute appendicitis, both on account of catarrhal infection of the lymphoid tissue and also by reducing the resisting power of the individual to the invasion of microörganisms.

It is not difficult to understand how a diseased and adherent appendix might be torn by indirect violence, nor can it be denied that an appendix, which was previously the site of typhoid, tuberculous, cancerous, or amœbic ulceration, might be perforated by any sudden mechanical force, as, for example, a railroad train collision.

THE NATURE OR MECHANISM OF THE INJURY.

Three types of trauma are known to have produced acute appendicitis, namely:

1. Blows, kicks, and violent force applied locally in the region of the appendix.

2. Falls, either from a height or from some moving object as a train, bicycle or carriage.

3. Muscular exertion or straining.

A fall may produce appendicitis in two ways: First, by producing a sudden violent slinging of the appendix, and, second, by a fall upon the region of the appendix, striking some stationary object. Kelly mentions attacks which which were brought on by straining, by jumping and by falling from a height, muscular exertion, as straining and lifting heavy weights in certain occupations, rowing, swimming, ballet dancing, etc. Blows in the region of the appendix are the most frequent cause. In Kelly's 50 cases the nature and the locality of the injury are as follows:

Blows, 24 cases.

Falls, 6 cases.

Muscular exertion, 20 cases.

In my own 4 cases the attacks were brought on as follows:

1. By swimming.

2. A blow caused by a collision with a messenger boy on a bicycle.

2. A blow in the appendix region caused by a falling box.

4. A fall across a wagon frame, striking the appendix region.

It will thus be seen that of the 4 cases which I have personally observed, 2 were caused by blows, 1 by a fall upon a fixed object, and 1 by muscular exertion. I have not included the 2 cases occurring in engineers who attributed their trouble to straining while reversing the lever of their engines. In none of the 4 cases was there any external evidence of injury such as a bruise, discoloration, or an abrasion of the skin.

MEDICO-LEGAL IMPORTANCE OF APPENDICITIS.

During the past year or two the number of suits for damages brought by persons injured, who have claimed that the injury was the cause of an attack of appendicitis, has increased to such an extent that this subject has come to be of very great importance to individuals and corporations who may in any way be liable for damages.

The Supreme Court of Alabama on the appeal of the Birmingham Railway, Light and Power Company vs. Moore held that the evidence which showed that in a woman who was previously healthy and had never exhibited any symptoms of appendicitis up to the time of her injury, but who, immediately following the injury and for six weeks thereafter, suffered from pain in the right side, which at operation was demonstrated to be due to appendicitis, was entitled to recover damages, notwithstanding that the operation upon her was a successful one.

The Supreme Judicial Court of Massachusetts, in 1904, held in a case of personal injury, Sullivan vs. Boston Elevated Railway Company, where the former was thrown from the seat of a large brewery wagon to the ground, a height of 8 or 9 feet, by a collision with a street car, the testimony of a physician warranted the jury in finding that the inflammation of the appendix was caused by the collision.

I have notes on many other similar rulings, which would serve to establish the fact that both medical and legal authorities now recognize "traumatic appendicitis." In view of this fact, as sugested by Kelly, "whenever a physician is called to see a case of appendicitis, where the history suggests tramatic origin, it is well to make careful notes at the time, quoting as far as possible the patient's own language and expressions, and noting the following facts:

1. The nature of the injury, whether a blow, a fall, or a strain.

2. The agent producing the injury.

3. The exact point and manner of impact, and whether the patient was engaged in active exertion or straining himself at the time the injury was received.

4. The expressions used by the patient at the time and the nature of his immediate complaints.

5. The length of time elapsing between the injury and the call for medical aid.

6. Whether there is any external evidence of violence.

7. If an interval of some weeks has elapsed, an inquiry into the condition of the patient during this period should be made, and it should be stated whether he was able to resume his ordinary occupations, with or without distress.

8. If death ensues or an operation is performed, it is of the highest importance to record the exact condition of the organs underlying the injured area, and to make a careful statement regarding the presence or absence of fecal concretions.

TREATMENT.

It is scarcely necessary to consider before this body the treatment of "traumatic appendicitis." Early recognition of the disease with prompt operative intervention is the only rational treatment. Deaver has forcibly emphasized the importance of bearing in mind: (1) the frequency with which acute appendicitis is caused by injury, (2) the early recognition of the nature of the lesion resulting from the injury, and (3) under favorable conditions immediate exploration with removal of the appendix.

In competent hands the mortality rate in cases of "traumatic appendicitis," treated surgically, is extremely low. It is unnecessary to insist that all cases of appendicitis should be referred to surgeons of practical experience who can command proper technical facilities.

Case 1.—Mrs. F., aged 45. Referred to me by Dr. R. P. Daniel.

The patient's history previous to present illness was that of a perfectly sound woman who had had no previous attacks of pain or other symptoms referable to the appendix; who had given birth normally to five children; and whose marital and menstrual history had been normal in every way. She had been very active, being an inveterate golfer and accustomed to taking a morning plunge in the swimming pool daily throughout the year. There was no history of previous digestive disorders, except that she had complained of periodical constipation with flatulence at intervals of one or two months.

History of the Onset.—This patient arose perfectly well in the morning, plunged into the swimming pool, and while swimming was seized with sudden intense pain in the appendix region; was nauseated, but did not vomit, though she was very weak from the intensity of the pain. She was seen by me ten days later when there was a large, hard mass in the appendix region, which was dull on percussion.

At operation there was found an inflammatory mass about a perforated retroperitoneal appendix. The position of the appendix, together with the manner in which the injury was produced, furnished the interesting feature of the case. The appendix, which was largely retroperitoneal, was without mesentery, and lay on the psoas muscle, a muscle which is used in the act of swimming. Recovery was very prompt following operation.

Case 2.—Miss W., age 23. Referred to me by Dr. R. L. May.

This girl, who had previous to the time of her injury been in perfect health, and who had had no previous attacks suggestive of appendicitis, was run into by a messenger boy of a large corporation and struck in the appendix region by a bicycle which was going at a rapid speed. She was knocked down and temporarily disabled. For several days following the injury she was confined to the house and complained a great deal of pain in the side. Three months later she was still unable to resume her work as stenographer, having been at no time free from abdominal pain and being confined to the house with a daily temperature ranging from 99 to 101. She had accepted a settlement from the corporation for $700.00 and released them from further obligation. Four months after her injury at operation the following condition was found:

Temperature 101, pulse 96. A large mass filled up the lower right side, extending over to the mid line and down into the pelvis behind the uterus. The mass was incised in midline and found to be a large appendiceal abscess. There were several concretions in the abscess cavity. This patient made a slow but complete recovery and was discharged from the hospital some four months after her operation.

In all probability the abscess had existed for some time and followed directly upon the receipt of the injury above mentioned.

Case 3.—Mr. A. C., age 30, Denver, Colo. Referred to me by Dr. Yates of Manatee, Fla.:

Past History.—Suspicion of tuberculosis. For some months this patient had been subjected to poor hygienic conditions, being unable to obtain good food properly prepared. Owing to the fact he suffered somewhat from digestive disturbances. Two weeks before his

admission to the hospital he fell from a wagon, striking the corner of the wagon frame, thus injuring directly the region over the appendix. He noted no discoloration of the abdomen from the blow. Pain was intense, and he was slightly nauseated at the time, but did not vomit, though he collapsed for a few minutes and had to lie down. The side remained sore and painful. A few days later he was taken with sudden intense abdominal pain, which was general in character and severe. He was moved to Tampa and treated for several days, getting temporary relief, conditions there being unfavorable for operation. About four days later he was again seized with severe abdominal pain, which became general. Pain required ¼ gr. of morphia every two hours for about ten hours, while he was being removed to Jacksonville for treatment.

At operation an appendiceal abscess was found very poorly walled off; there was considerable peritonitis apparently spreading in every direction. The abscess extended over the brim of the pelvis, and the appendix, which was very long and was perforated about an inch and a half from its tip, was also found to extend well down into the pelvic cavity. A large fecal concretion was present, and the appendix at its tip was slightly cystic owing probably to the obstruction to its lumen occasioned by the large concretion. In spite of the fact that when he was admitted to the hospital this patient was vomiting stercoraceous matter from obstruction due to adhesions, he recovered promptly following removal of the appendix and relief of the obstructing bands.

The features of this case are its relation to the injury, and the presence of fecal concretion in a slightly cystic or bulbous appendix, which was very long and extended into the pelvic cavity.

Case 4.—Male, age 42. Admitted to my service at St. Luke's Hospital with a history of being struck by the corner of a falling box.

Past History.—Fifteen years previously he had an attack of acute appendicitis, but had an interval of freedom from symptoms from that time until the time of his injury. The nature of the injury was that of direct violence of considerable force. The onset of the attack was almost immediate, pain being severe but colicky in character, and referred to the region of the navel.

Upon admission the day following the injury there was no elevation of temperature and only slight local tenderness. At operation through a McBurney incision, I removed an almost totally obliterated appendix which appeared as a small white cord and which, microscopically, showed absence of muscle fibres, total obliteration of the lumen, an increase in the fibrous tissue, with marked decrease in blood supply.

In this case we have an example of injury inducing an attack of acute appendicular colic in an individual whose appendix fifteen years previously had been the seat of acute inflammation, and which had subsequently become almost obliterated and atrophied throughout its entire length, being reduced to a thin, fibrous, pale, somewhat flattened cord, "appendicitis obliterans."

MINUTES OF THE FIFTH ANNUAL MEETING OF THE ROCK ISLAND SYSTEM SURGICAL ASSOCIATION, DENVER.

DECEMBER 4, 1907, MORNING SESSION.

Meeting called to order at 11:00 o'clock a. m. by Dr. S. C. Plummer, chief surgeon.

On motion, duly seconded and carried, Dr. D. S. Fairchild, of Clinton, Iowa, was made chairman for the day.

Dr. W. W. Grant, of the local committee, made the following announcement:

The local committee tender to the wives of the attending surgeons complimentary tickets to the Orpheum theater this afternoon.

That arrangements have been made with "The Seeing-Denver Automobile Company" for the ladies to take an excursion around the city at 2:00 o'clock tomorrow afternoon at one-half fare.

That on Friday the local committee tender to the visiting members a complimentary ride over the Moffat road.

Dr. Plummer moved that the reading of papers be limited to 20 minutes and that all discussion be limited to 5 minutes. Seconded and carried.

It was also moved, seconded and carried that

all members discussing papers should step to the platform and announce their name and address before proceeding to discuss any paper.

Hereupon the scientific program was taken up, the first paper read being "The Treatment of Burns and Scalds," by Dr. F. A. O'Brien, Emmettsburg, Iowa. Discussed by Drs. F. R. DeHoney, Holdenville, Okla.; J. E. Minney, Topeka, Kan.; D. J. Christopher, Colorado Springs, Colo.; S. Steelsmith, Abilene, Kan.; M. W. Bacon, Chicago; L. W. Littig, Iowa City, Iowa; D. P. Teter, Chicago; A. R. Mitchell, Lincoln, Neb., and discussion closed by Dr. O'Brien.

The next paper read was "Railway Surgery in the Orient," by Dr. W. F. Pierce, Carson, Iowa. No discussion.

Paper, "Conservative Surgery," was read by Dr. H. M. Dean, Muscatine, Iowa. No discussion.

On motion, duly seconded and carried, an adjournment was hereupon taken until 2 o'clock p. m.

DECEMBER 4, AFTERNOON SESSION.

The meeting was called to order at 2 p. m. by the chairman, Dr. Fairchild. The first paper read was "Injuries of the Knee Joint," by Dr. E. B. Gilbert, Geneseo, Ill. No discussion.

Paper, "Varicose Ulcers—Traumatism as an Exciting Cause—Treatment," by Dr. H. E. Campbell, Anita, Iowa. Discussed by Drs. H. M. Dean, of Muscatine, Iowa; A. E. Spalding, of Luverne, Minn.; J. H. McLean, Bureau, Ill.; M. W. Bacon, Chicago; William F. Fee, Meade, Kan., and discussion closed by Dr. Campbell.

Paper, "The Railway Surgeon and Railway Sanitation," by Dr. H. M. Bracken, St. Paul, Minn. Discussed by Drs. F. H. Staley, Clear Lake, S. D.; J. E. Minney, Topeka, Kan.; C. D. Thomas, Peoria, Ill.; S. C. Plummer, Chicago, and discussion closed by H. M. Bracken.

Paper, "A Demonstration of the Maxwell-Ruth Method of Treating Fractures of the Neck of the Femur," Dr. C. E. Ruth, Denver, Colo. Discussed by Drs. L. Reynolds, Horton, Kan.; W. W. Grant, Denver, Colo.; H. A. Leipziger, Burlington, Iowa; H. Jerard, Pleasant Hill, Mo.; F. B. Dorsey, Keokuk, Iowa, and discussion closed by Dr. C. E. Ruth.

Dr. Grant moved that a vote of thanks be extended Dr. Ruth for his excellent demonstration. Seconded and carried unanimously. The chairman, Dr. Fairchild, made some remarks touching the demonstration of Dr. Ruth.

Upon motion, duly seconded and carried, the meeting adjourned until 9 o'clock a. m., December 5, 1907.

DECEMBER 5, 1907, MORNING SESSION.

Dr. E. N. Allen, company surgeon, McAlester, Okla., was elected chairman of the day.

Paper, "Treatment of Sprains," by Dr. Ferd. Engelbrectson, local surgeon, Chicago. Discussed by Dr. L. W. Littig, S. C. Plummer, chief surgeon, and Dr. Engelbrectson in closing.

Dr. M. W. Bacon, Chicago: Just at the closing hour last night we listened to what was in my opinion a very interesting paper upon "Conservative Surgery." The lateness of the hour and the appetites of the assembled surgeons allowed no moment for discussion at all. I would like to ask the privilege of at least enough time taken up at this time to thank Dr. Dean for what to me in railway surgery was a very good paper indeed, and I move we tender the Doctor a vote of thanks for his paper. Motion seconded by Dr. S. C. Plummer, and carried unanimously.

Paper, "Fracture of Neck of Femur, with Report of Three Cases," by Dr. E. S. McDonald, local surgeon, Cameron, Mo. Discussed by Drs. John D. Seba, Bland, Mo.; H. M. Dean, Muscatine, Iowa, and discussion closed by the essayist.

Dr. S. C. Plummer announced that he had received word the following members whose name appear on the program would not be able to be present, and he moved that the papers be read by title and published in the proceedings: "Some Points on Treatment of Compound Fracture of the Leg," Dr. P. M. Burke, local surgeon, La Salle, Ill.; "Demonstration of a New Splint for the Humerus," Dr. S. B. MacLeod, local surgeon, Chicago; "Colles' Fracture," Dr. W. O. Brown, local surgeon, Sratford, Texas; "The Causes and Treatment of Non-Union in Fractures," Dr. T. H. Wagner, local surgeon, Joliet, Ill. Motion seconded and carried.

Paper, "Some Observations on the Ear," Dr. J. E. Minney, oculist and aurist, Topeka, Kan.

Dr. F. E. V. Shore came into the assembly room at this time, and it was suggested that he read his paper on "Tonsilar Hypertrophy and the Middle Ear," and this paper and the preceding one be discussed together. The following members participated in the discussion, namely, Drs. W. C. Bane, Denver, Colo.; C. D. Thomas, Peoria, Ill.; F. Vinsonhaler, Little Rock, Ark.; A. H. Andrews, Chicago; L. Reynolds, Horton, Kan.; H. A. Leipziger, Burlington, Iowa, and discussion closed by Drs. Minney and Shore.

Paper, "A Case of Mastoid Abscess with Operation and Results," Dr. L. E. Willis, local surgeon, Newport, Ark. Discussed by Drs. A. H. Andrews, Chicago; J. E. Minney, Topeka, Kan.; M. W. Bacon, Chicago, and discussion closed by Dr. Willis.

Paper, "Expert Testimony," Dr. F. M. Floyd, division surgeon, St. Louis, Mo. Discussed by Drs. J. M. Ristine, Cedar Rapids, Iowa; J. E. Minney, Topeka, Kan.; T. B. Bradford, Cotton Plant, Ark.; D. S. Fairchild, Clinton, Iowa; H. M. Dean, Muscatine, Iowa, and closed by Dr. Floyd.

Dr. S. C. Plummer requested the members immediately upon adjournment to grant the request of a Denver photographer to photograph the members, and to repair immediately to the Stout street entrance of the hotel.

Dr. W. W. Grant, of Denver, announced that the management of the Albany hotel tendered the members and their ladies a complimentary ball at 8 o'clock this evening at the assembly room of the hotel.

On motion, duly seconded and carried, the association adjourned until 2 o'clock p. m.

DECEMBER 5, AFTERNOON SESSION.

The chairman, Dr. E. N. Allen, not being present, it was moved, seconded and carried that Dr. J. E. Minney act as vice chairman until Dr. Allen's return.

Paper, "The Influence of Trauma in the Production of Displacements of the Female Pelvic Organs," Dr. C. K. Flemming, consulting surgeon, Denver, Colo.

It was suggested that inasmuch as the following paper on the program related to the same subject as the preceding paper, that the paper entitled "Traumatic Retroversion of the Uterus with Report of Three Cases," by Dr. M. W. Bacon, local surgeon, Chicago, be read at this time and the two papers discussed together, which suggestion was concurred in.

The above papers were discussed by Drs. D. S. Fairchild, Clinton, Iowa; S. C. Plummer, Chicago; F. B. Dorsey, Keokuk, Iowa; W. L. Brown, El Paso, Texas; L. H. Munn, Topeka, Kan.; S. B. Hall, Rock Island, Ill., and the discussion closed by Dr. M. W. Bacon.

Paper, "The Bier Treatment of Acute Infection, with Report of Cases," Dr. A. E. Palmer, local surgeon, Morris, Ill. Discussed by Drs. W. W. Grant, of Denver, Colo.; John D. Seba. Bland, Mo.; L. H. Huffman, Hobart, Okla., and discussion closed by the essayist.

Dr. W. W. Grant exhibited a case of oblique or spiral fracture of the tibia, showing the splints used by him in such cases.

Paper, "Personal Methods in Emergency Surgery," Dr. F. B. Dorsey, Keokuk, Iowa. Discussed by Dr. John D. Seba, Bland, Mo., and closed by Dr. F. B. Dorsey.

The author of the following paper, Dr. H. A. Leipziger, of Burlington, Iowa, requested, inasmuch as the reading of his paper would not take up the allotted time, to further discuss Dr. J. E. Minney's paper read at the morning session, "Some Observations on the Ear," which permission was granted him. After his remarks he read a paper entitled "A Case of Pulmonary Embolism Following Abdominal Operation."

Dr. S. C. Plummer: It is my wish that every member of this association should be a member of the American Association of Railway Surgeons. The advantage of this is you can get the proceedings of this meeting as well as the proceedings of other associations like ours, and more especially the association of the Chicago, Milwaukee and St. Paul road, as well as all the papers and discussions in the meetings of the American Association of Railway Surgeons. This will be explained to you by the secretary of that association, who is a member of our association, Dr. Jennings, of

Council Bluffs, and I hope Dr. Jennings will arrange to get the applications of all the members of this association who are not members of the American Association of Railway Surgeons; and I would like to have you give a few minutes to Dr. Jennings now.

Dr. S. C. Plummer announced that Dr. P. W. Darrah, local surgeon, Leavenworth, Kan., who was to have read a paper entitled "The Use of Antitoxins in General and Localized Peritonitis Caused by Abscess," and Dr. R. A. Kerr, local surgeon, Peoria, Ill., who was to have read a paper entitled "Justice the Only Safe and Practical Basis for Settlement in Claims for Trespass," had notified him of their inability to be present.

The last paper read was "Malarial Hematuria," Dr. T. B. Bradford, local surgeon, Cotton Plant, Ark., which was discussed by Drs. W. W. Grant, of Denver, Colo.; Edward Meek, Little Rock, Ark.; J. E. Minney, Topeka, Kan.; W. F. Baskerville, Booneville, Ark.; H. B. Jennings, Council Bluffs, Iowa; A. H. Clark, Worthington, Minn.; W. D. Bolton, Clinton, Okla.; L. E. Willis, Newport, Ark.; J. H. McLain, Bureau, Ill.; L. P. Woodworth, De Vall's Bluff, Ark.; M. W. Bacon, Chicago, and discussion closed by Dr. T. B. Bradford.

Dr. H. A. Leipziger, of Burlington, Iowa, exhibited an apparatus used by him after reduction of fracture of the bones of the face, which fracture was caused by a horse stepping on a man's head.

Dr. W. A. Duringer, of Ft. Worth, Texas, moved that a rising vote of thanks be extended to the Committee of Arrangements, the citizens of Denver, the management of the Albany hotel, the officials of the Rock Island lines, Mr. George W. Martin, local agent of the Rock Island road, the Pullman Company, and the officials of the "Moffat Road," for courtesies extended the society and its members during the session. Which motion was seconded and carried unanimously.

Dr. H. M. Dean moved that a vote of thanks be extended to Dr. S. C. Plummer, chief surgeon, which was seconded and carried unanimously. The meeting then adjourned *sine die*.

(There were 178 surgeons in attendance.)

At the recent meeting in Denver of the Surgeons of the Rock Island Lines, the wives gathered together in the parlor of the Albany and formed the "Woman's Auxiliary to the Annual Association of the Surgeons of the Rock Island Lines." Mrs. Charles R. Hume, of Anadarko, Okla., was elected chairman, and appointed the following committee on permanent organization, to report next year:

Mrs. S. C. Plummer, Chicago, Ill., chairman of committee.

Mrs. E. N. Allen, McAlester, Okla.

Mrs. Edward Meeks, Little Rock, Ark.

Mrs. F. H. Matthews, Liberty, Mo.

Mrs. E. B. Gilbert, Geneseo, Ill.

The following resolutions were unanimously adopted:

Whereas, It has been our great privilege to again be permitted to meet with the Annual Association of the Surgeons of the Rock Island Lines, be it

First Resolved, That we, the wives of these Surgeons, extend our sincerest thanks to the chief surgeon of the Rock Island Lines, Dr. S. C. Plummer, for the great courtesy and kindness again shown to us, and assure him of our grateful appreciation of this and all other courtesies thus extended through his influence.

Second, Resolved, That we desire to express to the officials connected with the traffic department of the Rock Island Lines our heartiest thanks for the transportation furnished us, for all the kind provisions made for our comfort on the trip and for the delightful excursion over the "Moffat Road."

Third, Resolved, That we extend a vote of thanks to Dr. Grant and the physicians of Denver for the entertainment furnished us at the Orpheum theater, and for all the kind thoughtfulness they have manifested toward the wives of the Surgeons.

Finally Resolved, That we sincerely approve of these annual gatherings, believing that they are conducive to closer relations between employer and employe all over the great Rock Island system, and are beneficial to us not only socially and intellectually, but that by our interest and influence in promising a larger attendance of the Surgeons we are thereby

showing in a practical way our appreciation of all the courtesies and benefits we have received.

(Mrs. C. R.) ANNETTE ROSS HUME,
Chairman.

MINUTES OF THE FIFTEENTH ANNUAL MEETING OF THE C., M. & ST. P. RAILWAY SURGICAL ASSOCIATION, CHICAGO, DEC. 5, 6, 1907.

DEC. 5—MORNING SESSION.

The secretary being absent, the meeting was called to order by Dr. J. G. Hayden, Chicago, and the Association immediately proceeded to nominate and elect a chairman. Dr. W. Van Werden of Des Moines, Iowa, was put in nomination, and upon motion duly made and carried, was declared elected.

There being no special business to come before the meeting, the Chairman announced that the Association would proceed to the reading and discussion of papers.

The first paper on the program, "Autointoxication After Injuries," by Dr. H. B. Hemenway, Evanston, Ill., was read, discussion following by Drs. D. N. Loose and L. R. Head, the essayist closing the discussion.

The next paper, "Subparietal Rupture of the Kidney," was read by Dr. J. G. Hayden, Chicago, discussion being had by Drs. D. N. Loose, Donald Macrae, Jr., P. Sorkness, H. B. Hemenway, W. G. Morrow, A. B. Poore, A. I. Bouffleur, and E. O. Plumbe, Dr. Hayden closing the discussion.

Upon motion the meeting adjourned to 1:30 p. m.

AFTERNOON SESSION.

The Association was called to order by the Chairman.

Paper entitled, "Skin-Grafting," by Dr. J. F. Pember, Janesville, Wis., was read, and discussed by Drs. L. H. Bowman, H. W. Bernard, E. H. King, C. A. Lester, L. R. Head, C. L. Wendt, W. F. Morrow, G. A. Ritchie, E. O. Plumbe, J. G. Hayden and A. I. Bouffleur, Dr. Pember closing the discussion.

The next paper to be read was by Dr. W. F. Morrow, Kansas City, Mo., entitled, "Burns and Scalds of the Head." Discussion was participated in by Drs. H. B. Hemenway, E. E. Barrett, C. L. Murdy, A. J. Alcorn, J. H. Rothwell, C. A. Lester, H. R. Hews, E. C. McDonald, E. H. King, T. McDavitt, C. W. Henry, the essayist closing the discussion.

Paper by Dr. H. H. Clark, McGregor, Iowa, "Expectant and Conservative Treatment of Wounds of the Abdomen," was then read and discussed by Drs. I. K. Gardner, E. E. Munger, J. H. Rothwell, C. E. Lester, L. D. Peck, E. C. McDonald and S. A. Spilman, the discussion being closed by the essayist.

Paper entitled "Traumatism of Varicose Veins," by Dr. A. J. Alcorn, Chicago, was read and discussed by Dr. T. N. Bogart.

The last paper read was by Dr. G. Kessel, Cresco, Iowa, entitled "The Treatment of Fracture of the Hip." Discussion was participated in by Drs. M. J. Kenefick, C. F. Noe, E. Kinnie, J. F. Pember, A. I. Bouffleur, W. J. Lonergan and F. B. Sigworth, and closed by the essayist.

Upon motion meeting adjourned to 9:30 a. m.

DEC. 6—MORNING SESSION.

The Association was called to order by the Chairman.

The two papers, "Subparietal Rupture of Abdominal Viscera," by Dr. W. C. Danforth, Chicago, and "The Problem Presented in the Treatment of Abdominal Contusions," by Dr. J. R. Hollowbush, Rock Island, Ill., were read, and discussed jointly by Drs. E. H. King and D. L. Brockman, the essayists closing.

The next paper to be read was entitled "Injuries to the Knee Joint," by Dr. C. L. Wendt, Canton, S. D. The paper was discussed by Drs. W. B. Johnson, A. B. Poore, T. L. Harrington, A. I. Bouffleur, and W. F. Morrow, the essayist closing the discussion.

The last paper read was by Dr. C. F. Larson, Crystal Falls, Mich., and was entitled "Observations in Surgical Clinics of Sweden," and was discussed by Dr. H. B. Hemenway, Dr. Larson closing the discussion.

The paper by Dr. Allen Staples, Dubuque, Iowa, entitled "Unusual Fractures," also the paper by Dr. S. A. Spilman, Ottumwa, Iowa, entitled "Fracture of Pelvis with Rupture of Urethra," were upon motion read by title and passed.

Dr. A. I. Bouffleur, chief surgeon, then outlined the company's plan for physical examination of new employes, after which upon motion the meeting adjourned.

APPENDICITIS CAUSED SOLELY BY FALL.

The U. S. Circuit Court of Appeals, Sixth circuit, says that, while the insured, under an accident policy, in New Amsterdam Casualty Company vs. Shields, was driving in a buggy a front wheel ran off and he was thrown against the dashboard, striking his abdomen. That night he complained of pain in his bowels, especially on the right. The next day, Friday, he was at his office, and that afternoon spoke to his family physician of the accident and of the soreness in his bowels. That night he was suddenly seized with severe cramping pains in the abdomen, nausea, vomiting, high fever, and rapid pulse. On Saturday his condition was worse. On Sunday mornng a surgeon of high reputation was called in consultation and the case diagnosed as acute appendicitis. An operation on Tuesday disclosed that the trouble was acute appendicitis, septic peritonitis and locked bowel. Death followed on Thursday.

The question was whether the fall against the dashboard caused the attack of appendicitis which brought about the death of the insured. It appeared that he had had two attacks of appendicitis 10 or 12 years before his final one.

The surgeons were divided in their views. Those who attended the insured were clear in the opinion that the attack of appendicitis which terminated fatally was caused by his fall against the dashboard and those who were called as experts only and gave their opinion on a hypothetical case were equally clear in the view that the attack of appendicitis was not caused by the fall, but that the septic peritonitis and locked bowel, which brought about his death, was occasioned by a crippled or diseased appendix as the result of chronic recurrent appendicitis.

If the insured recovered from his former attacks of appendicitis, so it no longer existed in his body, and there was only a susceptibility to have it in case a proper exciting cause should arise, and in this case the fall against the dashboard proved to be such exciting cause, the case would be one for recovery under the policy; but if because of the former attacks there was not merely a susceptibility to a further attack, but the actual disease itself existed, liable to be rendered active and virulent by an injury such as that suffered by the insured, in that event the active disease which resulted in death would not be regarded as the result of the fall alone, but as the joint result of the fall and the latent disease, and hence there could be no recovery under the policy.

The question whether the disease which brought about the death of the insured was itself caused solely by the fall against the dashboard was submitted to the jury, which found it was, and judgment on their verdict for the beneficiary is here affirmed.—*Journal A. M. A.*

A TROLLEY HOSPITAL.

A hospital car was recently placed in service on the street railway lines in Milwaukee. The interior is fitted with three leather upholstered permanent stretchers. Hooks are placed in the side near the ceiling, from which a fourth stretcher may be suspended. At either end are stationary cabinets supplied with complete surgical outfits, consisting of all necessary instruments, as well as dressings that might be called for in emergency cases. The car is electrically heated, and water in a 2-gallon tank fed from a larger receptacle may be heated in the same manner. The car is not designed for city work, but in outlying districts, far removed from a hospital, first aid will be direct on the ground instead of bringing the sufferer to the city. The car was built and equipped after plans prepared by Dr. C. H. Lemon, of Milwaukee, chief surgeon.—*Medical Record.*

LEG ULCERS.

Vörner recommends the application of a thin bandage, which is covered with a gelatin coating consisting of tragacant 0.5, gelatin 10.0, glycerin 5.0, boric acid 5.0, sodium borate 5.0, and water q. s. ad 1,000, which is covered in turn by another thin bandage, for the treatment of leg ulcers.—*Lancet Clinic.*

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POST-TRAUMATIC APPENDICITIS.

The second Symposium on Trauma as an Etiologic Factor will be found elsewhere in this issue. The subjects selected this year were Tuberculosis and Appendicitis. In addition to the discussion and papers read on the latter at the last annual meeting, extracts are given from various sources, so a rather good idea of the present opinions on this subject may be had. As a result of their perusal it would seem that as regards the connection between trauma and appendicitis the Scotch verdict, "Not proven," can be safely brought in.

THE WOMAN'S AUXILIARY.

At the late meeting of the Rock Island System Surgical Association, the wives of the members organized themselves into a "Woman's Auxiliary." As may be seen from the preamble and resolutions printed elsewhere, this body has mapped out a commendable sphere of action. The movement seems timely, and one to be followed by the wives of the members in other similar system associations.

ORGANIZATION OF THE NORTHWESTERN SURGEONS.

The surgeons on the Northwestern Lines have organized, following the example of those on the St. Paul, the Rock Island System and others. There is no doubt as to the value of such organizations from which the parent body may draw its quota of delegates. We bespeak for the new body a prosperous future.

THE OPHTHALMO-REACTION.

In connection with the value of the tuberculin test for tuberculosis alluded to by Professor Evans in his address at the Chicago meeting, it is interesting to learn of a new reaction for this protean disease introduced by the well known scientist—Calmette of Lille. This consists in injecting a drop of his tuberculin into the inner conjunctival sac. If tuberculosis is present, in from 3 to 10 hours, sometimes sooner, at others longer, a positive reaction is manifested. At first this merely consists of a slight reddening of the conjunctiva

near the caruncula, with a little lacrymation. In slight cases this is all there is to be seen, and unless sought for carefully the reaction may be overlooked. It can easily be recognized by comparing it with the untreated eye. The amount of the reaction seems to bear no relation to the extent of the disease process. In other cases the whole eye may be red appearing like conjunctivitis. In a few days—2 to 10—the eye clears up. One important feature is that the eyes must be perfectly sound, any acute or chronic disease contraindicates its employment.

MacLennan of England has used it in over 100 cases, and Bazy of Paris, in 18. In a small proportion of these the reaction failed, in the rest it was successful and often revealed the presence of unsuspected tuberculosis. It has also been used for the detection of pulmonary tuberculosis, in fact it was introduced for this purpose. The method is still in its infancy, but the results already obtained lead one to await further experience with interest.

A RAILROAD EQUIPMENT.

The emergency chest supplied to the shops on the Erie Railroad system contain the following:

Twelve gauze roller bandages, 1 inch; 6 gauze roller bandages, 2 inches; 6 gauze roller bandages, 2½ inches, and 6 gauze roller bandages, 3 inches wide; 6 Red Cross ligatures, silk and catgut, with needles threaded; 3 one-yard cartons bichlorid gauze; 1 spool "Z O" adhesive plaster; 4 ounce bottle Synol soap; 4 quarter pound packages bichlorid absorbent cotton; 2 two-ounce jars iodoform ointment; 1 Hand Book of First Aid; 1 box Munroe's antiseptic powder; 1 Tourniquet (Esmarch's); 1 pair bandage scissors; 1 two-ounce bottle aromatic spirits ammonia, with glass stopper; 3 one-ounce package surgeon's lint; 6 splints, whitewood; 1 paper safety pins, medium; 1 pint bottle carron oil for burns; 2 blankets; 1 gallon enamel basin; 1 stretcher.—*Red Cross Notes.*

Translations

TRAUMATISMS AND APPENDICITIS.

A PATHOGENIC AND MEDICO-LEGAL STUDY.

BY E. JEANBRAU,

Adjunct Professor in the Medical Faculty, and

J. ANGLADA,

Interne in the Hospitals of Montpellier, France.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

CASE HISTORIES..

A few cases have a history of past attacks of appendicitis:

Dubarry. A man of 31, in April was attacked by appendicitis which yielded to medical treatment. In October another crisis following a direct trauma to the abdomen. Laparotomy—appendix found completely gangrenous, no concretion.

Chapon. A man of 29, in October, 1898, had a crisis with vomiting and fever; in January, 1899, a second crisis, which lasted 4 days, with a persistent painful point. On July 19, 1899, he ran to catch an omnibus and was seized with a violent pain, which, however, was not severe enough to prevent him reaching home. Operation on the 26th. The appendix was perforated, but did not contain any concretion. Death August 1.

Henning. A subaltern in the army, who declared he had never been ill, was kicked by a horse in the epigastric region on November 1, 1903. After a short interval of unconsciousness he resumed his duties. On November 4, after mounting his horse, he was seized with violent pain with the greatest intensity in the region traumatized. He entered the hospital the following day with symptoms of general peritonitis, and was operated on at 7 the same evening. After having incised a hematoma of the rectus (this, says the author, is important from a medico-legal standpoint, because the skin showed no signs of contusion) the appendix was found turgescent, violet-colored and adhering to the iliopsoas. It was the size of the little finger and was bent on itself at a right angle. Near the part divided was an ulcer the size of a penny; the cavity contained 2 concretions the size of date seeds; the mucosa was thinned and gangrenous in places; the muscularis was much thickened. "The stenosis of the appendicular cavity, the thickening of the wall, point to an old lesion," says Henning, "and from an anatomic standpoint there should

be no hesitation; it was an exacerbation of appendicitis." Moreover, on questioning this patient, he stated that he frequently had pains in the abdomen, and diarrhea. Thus giving the clinical proof of an old intestinal lesion which had constituted little by little appendicular lesions to which the accident had given a sudden impetus.

Southam. This is similar to the preceding ones. A boy of 15 made a violent effort in trying to step into a boat while fishing. Nine months previous he had two rather mild attacks of abdominal pain. Pain in the right iliac fossa, then general peritonitis. Laparotomy, abdomen full of pus; the appendix could not be found and search for it was abandoned on account of the patient's critical condition. Nevertheless, Southam believes it was a case of appendicitis.

In the remaining cases there is no information as to previous illnesses. We should be far from the truth if we attributed them to appendicitis appearing as the result of an accident in a healthy person. The best proof of this is the fact that of the 43 cases no less than 24 are cases of calculous appendicitis, that is to say old cases dating back some years, or at least some months. For this reason the cases have been subdivided, and the sentence in parentheses in each case history is the interpretation which we have placed on the case.

(A). A NON-CALCULOUS APPENDICITIS FOLLOWING A DIRECT BLOW ON THE ABDOMEN.

1. *Gordon.* Boy of 14, struck by the fist in the right iliac region. Next day symptoms of appendicitis. Appendix perforated by a pin which had been swallowed a year previous. (The pin seems to us to have been the chief cause. It is questionable if it had been absent whether the fist blow would have had any serious consequences.)

2. *Gordon.* Child of 8, was kicked on September 18 over the appendix. Pain, symptoms of peritonitis during the night. Necropsy Sept. 22, multiple abscesses, appendix perforated in two places.

3. *Legueu.* Child, kicked in the right flank and fell to the ground. Peritonitis, laparotomy, perforation of the appendix. This case appears convincing to us. (Unfortunately details are lacking as to previous illnesses. Had there been no previous crises?)

4. *Guinard.* Man of 18, kicked by a horse in the right iliac fossa. Three attacks of appendicitis in succession. Operation 2 years later. Appendix rigid, turgescent; the swollen mucosa was ecchymotic. (It seems to us impossible to decide whether or not this was a case of traumatic appendicitis. The lighting up of a latent appendicitis would be more probable.)

5. *Hume.* Struck in right flank by wagon. Pain in the appendicular region. Several recurrences in the next 9 months at the end of which time laparotomy was performed. Appendix thickened, numerous adhesions to bladder, cecum and small intestine. (Same interpretation as No. 4.)

6. *Körte.* Struck in right flank by an iron rail. Laparotomy, appendix completely gangrenous.

7. *Moty.* Soldier, aged 21. Four years before fell out of a wagon, striking right flank. In bed for a month. Since then has had pain over McBurney's point on pressure, at times severe enough to send him to bed. Laparotomy, appendix folded, adhering to cecum. Obliterated at curve, terminal part much atrophied. (The persistence of the symptoms after the accident seems to us to be a strong argument in favor of the etiologic rôle of the accident 4 years before.)

8. *Jungst.* Man crushed by the fall of a rock, contusion of the right half of the pelvis, dislocation of hip. Two years later with no apparent cause peritonitis and perforation of the appendix. Jungst believes the old trauma had caused a chronic lesion of the appendix which became acute 2 years later. (The relation does not seem to us established. After 2 years without symptoms we should not think of traumatic appendicitis.)

(B) NON-CALCULOUS APPENDICITIS FOLLOWING AN ACCIDENT, BUT WITHOUT ANY BLOW ON THE ABDOMEN.

9. *Page.* Man of 28, in lifting a weight felt an acute pain in the region of the appendix, crisis of appendicitis. Four recurrences in 8 years. Laparotomy, appendix stiff, turgescent as if under tension. Stenosis of the cavity from thickening of the walls; no perforation. (Valueless as evidence.)

10. *Page.* Man of 34, violent pain following efforts at defecation. Intervention after 2 days of expectant treatment during which appendicitis was not suspected. Perforation near mesoappendix. (This no doubt is a case of appendicitis in which the straining ruptured some adhesions.)

11. *Gordon.* Girl of 8, fell while jumping. Symptoms of appendicitis next day. Laparotomy, perforation of appendix. (Same interpretation as No. 10.)

12. *Gordon.* Girl of 11, after running up and down stairs several times, violent pain in

the abdomen. Localization of pain in the region of the appendix. Laparotomy, perforation at tip. (Same interpretation.)

13. *Gordon.* Child of 13, after purgation with castor oil, violent pain in the abdomen. Localization of pain in the region of appendix, then general peritonitis. Necropsy, false membranes, appendix bathed in pus and perforated at end.

14. *Gordon.* Child of 9½, knocked down backwards at play. Pain in right flank, then symptoms of appendicitis. Operation in the interval. Appendix thickened, folded on itself, thick adhesions.

15. *Macdonald.* Man fell on perineum, receiving contusion of right testis. Acute orchitis in a few days. Pain along the cord and into the bladder, but not to region of appendix. The latter appeared 2 days later, with vomiting and peritonitis. At the operation appendix violet-colored, adhering to the bladder, resection. Examination of the adhesions showed they were of long standing, while the appendicitis appeared to be primary. (This case is of no value, the fall on the perineum played but a secondary rôle. It is even possible that the acute orchitis brought on by the violence was propagated from extension of the appendicular inflammation to the cord.)

16. *Statistics of Prussian Army.* Soldier overfatigued during drill. At the operation slight lesions of appendicitis; neither perforation nor calculus. (Valueless.)

17. *Ibid.* Soldier made a sudden leap. Slight lesions discovered at operation, no perforation, no concretion. (This is evidently a case of latent appendicitis.)

18. *Macdonald.* Woman of 24, in the course of violent exertion, intense pain in the region of appendix which was transmitted to the whole abdomen. The patient was suffering from chronic ovaritis, which she attributed to a trauma 2 years before. Operation in 2 days. Appendix gangrenous at the end, with many adhesions to the ovary and cecum. The author believes that the first trauma gave rise to the ovaritis, then the inflammation reached the appendix, and under the influence of the second trauma the latent appendicitis became acute. (Macdonald's interpretation seems somewhat logical, while traumatic ovaritis should be looked on with suspicion. We should rather incline to an ovaritis of uterine origin.)

19. *Macdonald.* A patient jumped violently from a carriage, and noticed some abdominal pain. Two days after there was vomiting with exacerbation of the phenomena. Rectal touch showed an indistinct mass; at the operation intussusception was found with inflammation of the invaginated loop. The appendix was caught between the two layers of the bowel, it was gangrenous and perforated at the tip. (This was certainly a case of old appendicitis.)

(c) CALCULOUS APPENDICITIS FOLLOWING ABDOMINAL CONTUSION.

20. *Page.* A man of 30, carrying basket weighing 30 pounds, fell on right flank; pain, vomiting. Nine days later admitted to hospital with symptoms of general peritonitis; death. Necropsy, appendix turgescent and inflamed; ulceration and perforation. In the pus bathing the appendix was a concretion the size of a bean. (This case as well as the following 11 are open to the same objection, the existence of concretions proves that the appendicitis existed before the accident, the latter could have had but an occasional rôle.)

21. *Gordon.* Child of 6, fell on a chair April 9th, on the 26th laparotomy. Perforation at tip, calculus.

22. *Gordon.* Child of 5, fell on a pile of rocks. Adominal pain in the evening, rapid development of peritonitis; death. Necropsy, appendix ulcerated, numerous perforations, large cylindric calculus.

23. *Gordon.* Child of 9, violent blow with fist in right flank. The next day, general peritonitis; death. Necropsy, appendix perforated at tip, concretion in lumen.

24. *Stern.* Adult man, blow in right flank, he continued at work. Next day symptoms of perityphlitis. Laparotomy, peri-appendicular abscess, 6 or 8 small concretions in lumen.

25. *Körte.* Child of 14, was lying down when a smaller brother jumped on abdomen. Peritonitis 4 days later, laparotomy. Perforation of appendix at site of concretion in lumen, numerous adhesions.

26. *Statistics of Prussian Army.* Soldier aged 21. Struck by bayonet in right flank. Symptoms of appendicitis and of general peritonitis. Laparotomy, peri-appendicular abscess, with a concretion bathed in pus. (This case is somewhat indefinite. Did the bayonet cause a peritonitis like that from stab wounds? In this case the calculus in the pus proves the wounded man had a calculous appendicitis.)

27. *Schottmüller.* Boy of 10 struck by a carriage shaft in the right iliac region. Very violent pain, symptoms of localized peritonitis. Laparotomy, appendix thickened and necrosed with a concretion in the lumen.

28. *Schottmüller.* Boy of 7, kicked twice in the right iliac fossa. Violent pain forcing him to bed. Symptoms of perityphlitis. Laparotomy, appendix thickened, violet-colored; gangrenous in one place. Perforation correspond-

ing to the situation of a concretion, which contained a fruit seed "like an egg in its shell." (The author admits that the necrosis of the mucosa due to the concretion antedated the trauma.)

29. *Neumann.* Child of 12, a basket pointed at one end was thrown violently against the right flank. Acute pain. Symptoms of localized peritonitis. Incised and drained, at the first dressing a concretion the size of a cherry pit and evidently of appendiceal origin was found.

30. *Neumann.* Man of 23, while lifting up a pig, the animal struggled, throwing him on his abdomen. Slight pain. Next day he got in a buggy, when the pain returned; he was able, however, to walk for some 7 hours. Then he showed symptoms of peritonitis by perforation. Laparotomy, appendix thick, floating in pus. Perforation the size of a small pea, a concretion of the same size in the pus.

31. *Southam.* Child of 9, fighting with his comrades, received several blows on the abdomen. Pain in the region of the appendix.

(D) CALCULOUS APPENDICITIS FOLLOWING AN ACCIDENT, BUT WITHOUT ANY BLOW ON THE ABDOMEN.

32. *Gordon.* Child of 11, fall on the back, 5 days later symptoms of appendicitis; death. Necropsy, appendix elongated and prominent; perforation of cecum. Concretion the size of a date stone in the cecum. (The same objection may be urged here as those under No. 20.)

33. *Fowler.* Man of 48, in picking up a large block of ice experienced violent pain in the right flank. He continued at work, however, with symptoms of appendicitis and peritonitis until his entrance to hospital. Laparotomy, numerous adhesions. Perforation one-half inch from tip, at site of upper end of calculus.

34. *Schottmüller.* Child of 9, while exercising in a gymnasium felt a sensation like a pin-prick in the right iliac fossa. The next day the pain seemed very severe. Laparotomy, the colon had small perforation. Appendix high up, containing concretion the size of a cherry pit.

35. *Neumann.* Man of 29, lifting a basket felt violent pain in the abdomen which progressively increased. Peritonitis 3 days later. Laparotomy, mucosa of appendix perforated at base, necrosed for ½ inch; 3 concretions in lumen.

36. *Neumann.* Man of 30, while lifting some meat weighing 190 pounds noticed acute pain in region of appendix which disappeared after rest for a while. Next day another attack, came to hospital on foot; symptoms of peritonitis. Laparotomy, appendix very thick, bright red, size of the little finger. At one spot it was thin, grayish and ready to give way. This corresponded to the location of a concretion the size of a cherry pit.

37. *Neumann.* Man of 20, strain while lifting a sack of potatoes, that evening violent pain localized in the right iliac fossa, symptoms of appendicitis. Laparotomy, the stump of the appendix was found bathed in pus, by the side of it a large calculus.

38. *Neumann.* Man of 41, acute pain in the abdomen after a long bicycle ride. Diffuse peritonitis. Laparotomy, perforation of the tip, concretion the size of a plum stone in the lumen. (The following is the probable mechanism involved: Continuous movement for a long time, the abdomen compressed in the crouching attitude, may cause a lesion of the mucosa by friction against the concretion, this epithelial desquamation allowing the entrance of microbes.)

39. *Neumann.* Man of 26, lifting a heavy ladder, felt a cracking noise in the abdomen, immediate pain in the umbilicus and right flank. Symptoms of localized peritonitis 4 days later. Laparotomy, perforation in the middle third, bean-sized concretion in the appendiceal lumen. (This case has all the value of an actual experiment, the cracking noise was produced by the rupture of the adhesions.)

40. *Neumann.* Youth of 16, lifting a heavy sack of potatoes, rather severe pain was experienced. Marked symptoms of peritonitis next day; death. Necropsy, appendix violet-colored, perforation ⅛ inch in middle, corresponding to concretion size of cherry pit and enclosing 2 hairs. (In this case also the effort seems to have brought on the acute crisis, the perforation, however, came on so rapidly we must surmise the wall was thin and ready to rupture. Very likely there had been rupture of the adhesions strengthening this thinned spot.)

41. *Neumann.* Man of 25, had a reducible inguinal hernia on the right, during an epileptic attack the hernia came down and became irreducible. It was reduced with considerable difficulty and some pain. After reduction signs of strangulation persisted. Laparotomy, a dense, deep red appendix was found in the sac surrounded by false membranes, with a perforation in the middle the size of a pea. The lumen contained a concretion the size of a cherry pit. (In this case also the effort seems to have brought on the acute crisis, but the perforation seems to have occurred too rapidly, unless the wall of the appendix had been thinned and ready to perforate. It is extremely

probable that there was rupture of the adhesions reinforcing the thinned zone of the organ.)

42. *Anghel.* Man of 48, while carrying a small burden at the age of 21 felt a sudden pain in the right flank. Innumerable crises of appendicitis, forcing him to enter the hospital every year. Laparotomy 27 years later; appendix fibrous, large chalky concretion in the interior. (This case, which is reported here because it has been quoted as a proof of the traumatic origin of appendicitis, is of no value whatsoever from this standpoint.)

43. *Delorme.* A soldier was kicked in the umbilical region by a horse and knocked down; acute pain. Symptoms of general peritonitis, laparotomy, nothing found in small intestine; death in 4 hours. Necropsy, small bowel uninjured. A perforation of 1-5 inch at base of appendix, the wall here was thinned. The organ itself was thick, turgid, folded behind the cecum. "The appendix," says Delorme, "the wall of which was already thinned and altered before the trauma, had to give way to the sudden pressure of the gas or the intestinal contents suddenly propelled from the lumen of the large or the small intestine into its interior." (This interpretation of Delorme is evidently the correct one.) * * *Revue de Chirurgie.*

In the discussion several speakers agreed with MM. Jeanbrau and Anglada. Guinard observed that the consensus of opinion thus far had been that trauma did not give rise to appendicitis, but lighted up a latent case of this disease. He was not entirely in sympathy with such opinions, and referred to four cases of his own. In Case 1 a man of 18 was kicked by a horse, in the next 2 months he had 3 attacks of appendicitis and was operated on in the interval. Before the accident he had never had the slightest symptom referable to appendicitis. At the operation the usual lesions of the disease were found. In this case it might well be asked if the trauma did not have something to do with the production of the appendicitis.

The second case concerned a child of 12 who was riding a donkey and falling off was kicked in the abdomen by the animal. Guinard examined the child carefully at this time, but could discover nothing. The following winter the child was seized with a mild attack of appendicitis, 4 months later another attack. He operated in the interval, and found the appendix bound down by adhesions, the mucosa was red and tumefied.

Case 3 concerned a man of 19 who, after falling a distance of 3 feet, had an attack of appendicitis. Guinard operated and found a hematoma, he removed the appendix at the same time. This presented no alteration.

Lastly, in the fourth case a woman had chronic appendicitis. Ten years previous the adnexa had been removed. Guinard operated and found the appendix filled with feces and adherent as a result of the old operation. In this case we might ask if the trauma from the first operation did not have some connection with the chronic appendicitis.

Guinard referred to other cases seen by his colleagues, and came to the conclusion that trauma may at times act in 2 ways: It may act directly; it may also give rise to secondary accidents of peri-appendicular peritonitis.

Tuffier thought that in no case could trauma provoke a true appendicitis.

M. Routier said there was no more reason for speaking of traumatic appendicitis than of traumatic orchitis. M. Felizet protested against this statement, and said that, in fencing academies, for example, orchitis of clearly traumatic origin was somewhat frequent. Routier answered that all the frequenters of these academies had had gonorrhea.—*Gazette des Hopitaux.*

A TUBERCULOSIS PROBLEM.

The Paris correspondent of the *Lancet* relates in the issue of September 23 the case of a man who had been for seventeen years in the service of a railway company, but had been discharged on the ground that he had tuberculosis and was not, therefore, fit to continue his work. He thereupon sued the company, and on the basis of the testimony of an expert employed by the court to ascertain the facts, he was awarded damages of 5,000 francs. It was held that his unfitness for active and regular work had not been proven because the progress of the disease from which he suffered was slow, and he was strong enough to follow his employment.—*Medical Record.*

Extracts and Abstracts.

TRAUMATISM AS AN ETIOLOGICAL FACTOR IN APPENDICITIS.

BY JOHN B. DEAVER, M. D.

The question of the relations existing between trauma and the etiology of appendicitis has of late awakened an unusual amount of interest on account of the medico-legal aspects of the subject and also on account of its relations with accident insurance. In many cases the attack had immediately followed a direct blow or fall upon the abdomen, in others had supervened upon prolonged exertion or a sudden strain of the abdominal muscles or iliopsoas muscles. Not only is it a subject of considerable medico-legal importance, but arguing from cause and effect, when an acute attack of appendicitis follows directly upon the receipt of a local injury, the liability of accident insurance companies must receive careful consideration. The question of criminal prosecution also enters into the subject, as cases occur from time to time in which an acute attack of appendicitis, ending fatally, are preceded by a blow or kick upon the abdomen. In these cases a most careful inquiry into the history of the acute attack and especially an investigation, from definite previous attacks, must be made.

It is a well recognized fact among the laity that considerable importance is placed upon an injury which may have preceded the onset of any disease, especially those of a surgical nature. This is well illustrated by the history frequently given by the patient or his friends, that the lesion immediately followed the receipt of an injury. The true importance of injury, therefore, should always be carefully considered in all cases, but undue stress should not be placed upon it as an etiologic factor in the production of disease without the most careful and painstaking investigation. What is here stated of all surgical lesions is especially important in considering the etiology of appendicitis.

In discussing the part trauma may play in the production of acute or recurrent attacks of appendicitis, it appears advisable to consider two questions:

1. Is it possible for injury, direct, as a blow or fall upon the abdomen, or indirect, as by muscular contractions of the abdominal or iliopsoas muscles, to produce in a perfectly healthy appendix an acute attack of appendicitis?

2. Is it possible for injury to produce an acute attack of appendicitis when the appendix is diseased?

In answering the first I would like to state I have never seen a case of acute appendicitis occur in which injury was alleged as the direct exciting cause in an appendix that did not show some evidence of previous disease. The question of how a blow or fall or a strain of the abdominal or iliopsoas muscles can have any direct effect upon this organ, lying as it does somewhat freely and well protected by the hollow viscera and the abdominal walls, must be problematic. It is a notable fact that most writers who have reported cases of appendicitis in which they state trauma can cause an acute attack, rarely if ever give their reasons for such a statement. In most cases they produce no evidence to prove whether the injury actually preceded an attack in a healthy organ, or merely was the exciting cause of an acute attack in an appendix already diseased. In all the cases reported it is probable the appendix was already diseased, and a careful study of these cases in detail will show that in a very large percentage there is evidence to prove that previous pathologic changes had occurred in the appendix which were not recorded in the histories, or were shown to be present by an examination of the changes found in and about the appendix at operation or at autopsy. We all know that foreign bodies, fecal concretions, strictures of the appendix, adhesions, etc., are frequently present without ever giving the patient any trouble or suggestion of any lesion in the right iliac fossa. This is shown by examination of appendices which have been removed when operations have been performed on other viscera and the appendix has been removed as a prophylactic measure, and also in many found at autopsy. It can readily be seen how such conditions would lead to error in

cases in which a history of a previous attack was not obtainable, and in which an acute attack supervened upon an injury.

The second question can readily be answered with more assurance. It is possible in an appendix, which is the seat of previous disease, that an injury can produce an attack of acute appendicitis. If direct violence is applied to the right iliac region or if there is prolonged or violent contractions of the abdominal or iliopsoas muscles over an appendix which contains fecal concretions, is dilated, flexed, or firmly adherent to the neighboring viscera or the parietes, we can readily see how an acute attack can be brought on by producing a tear in the mucous membrane and thereby allowing the virulent organisms in the appendix to find a suitable means of producing rapid gangrene and perforation. It is also possible in an appendix which is acutely flexed, contains fecal concretions, is completely stenosed and dilated beyond the point, or firmly adherent to neighboring structures, that a rapid obliterating endarteritis of its vessels may be produced by trauma.

Investigations of recent years have conclusively demonstrated that the *Bacterium coli* is the most frequent pathogenetic organism present in the appendix. Of 286 appendices examined bacteriologically at the German Hospital, 128 were instances of acute appendicitis.

The *Bacterium coli* was found alone in 72.65 per cent of the acute cases and 89.87 per cent of the chronic cases; it was found either alone or in combination with other bacteria in 117 (91.4 per cent) of the acute cases, and in 151 (96.2 per cent) of the chronic cases.

We can conclude that the *coli* is a constant habitant of the appendix; that other bacteria are frequently found in conjunction with it, which can be demonstrated more readily by a coverslip preparation of the exudate rather than from cultures, on account of the inhibitory action the *Bacterium coli commune* has upon other bacteria, and that while many cases of appendicitis are due to one single form of bacteria, it is frequently due to mixed infection.

It is doubtless true that all acute attacks are due to bacteria, and that the severity depends upon the virulence of the infecting organism and upon the resisting powers of the individual. It is therefore necessary to consider what conditions make the appendix more liable to the successful attack by micro-organisms than the remaining portions of the intestine. These factors are several. Of chief importance is the terminal blood supply and the subsequent anemia of many appendices. The blood supply is defective, not so much because of the evident alterations frequently seen in the walls of presumably normal appendices, but chiefly because of the liability of the occurrence of partial or complete obstruction. The obstruction may be due to increased tension within the lumen of the appendix, due in some cases of distention of the cecum to swelling of the mucous membrane, or to stricture, completely closing the lumen of the appendix. Obstruction may also result from twists, external bands of adhesions, angulations, etc. Thrombosis, secondary to an infective folliculitis, is occasionally seen. The presence of fecal matter is at times a source of circulatory and nutritional disturbances. These are produced by the efforts made by the appendix, through peristalsis, to empty itself of fecal matter, inspissated detritus, foreign bodies, etc. These attempts often produce marked congestion of the walls of the appendix, usually at a point distal to the concretion, and as a result a marked fibrosis occurs in the walls of the appendix. This fibroid change in the mucosa and submucosa occurs as a result of repeated protective efforts of the lymphoid tissue of the mucosa. This increase of fibrous tissue produces a lack of tonicity of its walls, so its normal peristaltic action is lessened, and that in time nutritional changes occur, and the formation of appendiceal concretions from inspissated material is readily understood. It may therefore be assumed the presence of a concretion in the appendix is conclusive evidence of previous disease. On account of the lessened peristaltic actions resulting from a fibrosis of the appendix, defective drainage results, and bacteria normally present in its lumen multiply and increase in virulence. A secondary fibrosis of the cecum undoubtedly results, owing to the virulence of the bacteria elaborated in the ap-

pendix, and in this way a colitis is eventually established, and many cases which are termed by clinicians enteritis, dyspepsia, constipation, etc., have their origin in a chronic catarrhal or fibroid change in the appendix. Defective drainage is also produced by conditions external to the appendix, by changes within its walls, by lesions within its lumen, and by certain anatomic and physiologic conditions.

Of external conditions capable of producing defective drainage may be mentioned constipation, distention of the cecum, fibroid changes in the cecum, adhesions binding the appendix to neighboring viscera or the parietal layers of the peritoneum, adhesions causing marked flexions, chronic inflammatory conditions of the mesoappendix, tumors, etc. Fibroid changes in the walls of the appendix lessen peristalsis, stenosis, tumors, etc., and may interfere with effective drainage. Stenosis caused by contraction of fibrous tissue in the mucosa and submucosa, congestive disturbances, foreign bodies, concretions, and inspissated appendiceal detritus may cause occlusion of the outlet of the appendix, and thus produce inefficient drainage. Of the anatomic peculiarities that may interfere with drainage may be mentioned a very short mesoappendix, abnormal situations of the appendix, abnormal changes in length and form, angulations, etc., and Gerlach's valve.

Any of these which may interfere with normal drainage ultimately induce passive congestion of the organ, lead to the formation of appendicular concretions, and the presence of these latter combined with imperfect peristalsis finally cause erosion of the mucous coat, with subsequent infection of all the coats, so a ready focus is produced for the invasions of bacteria of increased virulence and absorption of their toxins. This in a great measure is the determining factor in the production of gangrene and perforation. And it is a significant fact that in a great majority of cases of perforation there is found, within the lumen, at a point proximal to the point of perforation, one or several concretions. Other factors to be considered in the pathology are the great amount of lymphoid tissue in the walls. This is especially liable to inflammatory changes throughout the body, whenever there is even the slightest irritation by micro-organisms. Infective thrombosis soon follows when virulent organisms have an opportunity to act upon an eroded or ulcerated area of the walls of the appendix. Inflammatory conditions of the appendix are also liable to occur in certain forms of intestinal disease, especially typhoid and dysentery, without any demonstrable symptoms at the time. And it is quite evident that after such conditions have disappeared from the intestines and the appendix, there is left certain fibroid changes in the walls of the appendix which often act as an etiologic factor in the production of subsequent inflammatory changes in the appendix.

It can readily be understood there cannot be any one certain determining factor in the production of all attacks of acute appendicitis. It is certain that all attacks are due to the action of micro-organisms of increased virulence acting upon tissue rendered abnormally less resistant by anatomic peculiarities, defective drainage, and prior infectious changes.

I feel perfectly confident that trauma is incapable of producing pathologic changes in a perfectly healthy appendix, and I base this statement upon cases observed during my extended experience in this work. I will, however, admit that in certain given pathologic conditions, as the presence of large concretions, empyemata of the appendix, etc., trauma may be an exciting factor in the production of an acute attack. In making these statements I am corroborated by various authorities. Neumann states that

"he does not believe that an empty appendix could be so injured that a direct lesion would result from external violence. The organ is too small and its fixation is too slight. If the appendix contained a firm body, as, for instance, a fecal calculus, it may be injured. The calculus does not rupture the intestinal wall, but tears it, and from this the infection involves the peritoneum."

R. Fitz states:

"Among 257 cases of appendicitis were 19 patients who were supposed to have received an injury, the result rather of indirect than direct violence, from lifting a heavy weight in 9 instances, and from a fall or a blow in 10

instances. Among 209 cases of typhlitis and perityphlitis external violence immediately preceded the attack of the disease in 10 per cent. In considering this statement we must take cognizance of the fact that a difficulty in the study of the relations of traumatism to appendicitis is the *post hoc propter hoc* argument. The individual receives a fall, a blow of the abdomen, or has had some noticeable strain, however remotely, and associated it with the subsequent condition."

Sherren states that

"injury plays little part in the production of first attacks of this disease, but the suggestion of Van Zwalenberg that the condition is due to hydrostatic pressure in the diseased appendix may be true in some cases. In attacks subsequent to the first, injury plays a greater part. In these cases a stricture is usually present, and the injury may determine the attack by causing rupture of the dilated portion of the appendix distal to the stricture."

Fowler states:

"Among the occasional causes of appendicitis laid down by writers, traumatism is mentioned. In my experience, not a single instance occurred in which a knock or a blow upon the abdomen or a fall constituted a portion of the history. The nearest approach to this is the case of an iceman, who attributed the attack to a strain he had received the day before in lifting a heavy block of ice from his wagon. Another instance is that of an athlete in whom the disease developed during the night after he had engaged in a game of football. In neither of these cases does it seem to me that the violent effort or exercise bore any causative relation to the attack of appendicitis."

Walker considers that on account of its anatomic peculiarities it is very liable to slight trauma and states that

"the primary exciting cause of a large majority of cases of appendicitis is the anatomical peculiarities of the appendix. Its liability to trauma is undoubtedly due to its location, resting as it does upon the much used iliopsoas muscle, together with its short mesentery and its inability to empty itself of its contents."

The author, however, in his long experience, does not record a single instance of a case being due to injury.

Bottomley states that

"it is probable that all attacks of true appendicitis are due to the action of bacteria, and that the severity of the disease, whether it be catarrhal or suppurative, resulting in a local abscess or in general peritonitis, depends upon the virulence of the infecting microbe and upon the resisting powers of the individual, and that injury has little, if any, part in its causation."

MacDonald states that

"much has been written at various times concerning the probability of an external injury having any direct effect in the causation of appendicitis. With the pathology of this lesion as taught today we are familiar. The low vitality of a vestigial organ renders it capable of presenting but feeble resistance to bacterial infection, while circulatory disturbances readily produced by imprisoned fecal matter, or by the accidental twisting or kinking of the organ, greatly accelerate the probability of a speedy absorption of the products of the intestinal micro-organisms. With this we are thoroughly in accord, but is it not possible, yea, even probable, that in some given cases the inflammatory condition in the appendix resulting in perforation may be propagated thereto by continuity of tissue? Whether it is of frequent occurrence, or the rare exception, remains to be learned from the deductions of the statisticians. The question of how a blow, or a fall, or a strain can have any direct effect on this rudimentary organ, lying somewhat freely in the abdominal cavity, and well protected by superficial soft parts, must be somewhat problematical."

Juengst states that

"an injury cannot produce an acute appendicitis in a healthy appendix, but can produce an acute exacerbation in a chronically diseased appendix, and particularly can it produce a perforation. It is generally believed that acute appendicitis never follows trauma, unless the appendix is previously diseased."

He believes, however, that the trauma can produce chronic appendicitis. In a case cited he says that

"the trauma produced a contusion, hemorrhage, or other injury of the appendix, thus giving rise to a chronic form of larvated appendicitis, which later became acute."

He quotes Sonnenburg as saying "that an injury to the ileocecal region gives a disposition to appendicitis," and refers to a case where a washtub produced the condition. Juengst says that "general injuries, such as lifting a heavy weight, falling on the ice, cannot produce this tendency, but direct injury to the ileocecal region can." He draws the following conclusions:

"A localized trauma against the iliac fossa can injure a healthy appendix or its surroundings to such an extent as to induce a chronic appendicitis. If such a trauma and a later acute appendicitis are connected by symptoms of ill defined pain in the abdomen, gastric distress, etc. (appendicitis larvata), a causal relation may be said to exist between the trauma, the acute and chronic appendicitis, even if several years have elapsed before the acute type is noted."

Blos states that

"if bleeding occurs in the abdominal cavity from any reason and the blood enters the ileocecal fossa, it is likely to remain there unabsorbed because of the small amount of peristalsis there normally; in other parts of the abdominal cavity it is absorbed within a short time. The blood in the neighborhood of the appendix, organizing into a thrombus, is the actual cause of inflammatory changes, such as adhesions; which, then, limit the mobility of the organ, etc. A trauma against the abdomen, and particularly against the right iliac fossa, sets up an acute appendicitis, and may even produce direct perforation. A trauma against any part of the abdomen may be the cause of the small amount of bleeding necessary to set up irritation in the right iliac fossa; the adhesions thus induced form the anatomical basis for the chronic 'traumatic' appendicitis."

Karrenstein states that

"the connection between trauma and appendicitis is very rare. The question of trauma was considered in the history of 233 cases, and in only two was a definite history of this found."

Nordmann states that

"he has seen 6 instances among 500 cases where trauma was said to have produced the condition existing. All of these patients had already a chronically inflamed appendix, as shown in four cases by fecal stones, but of these conditions the patients were not aware, until the injury produced a perforation of the points of these stones or at some other weak spot; immediate peritonitis was the result, as no adhesions existed; the peritonitis therefore was due to the trauma, and not the appendicitis. Infectious material filled the appendix before the injury. Only then can a trauma be considered as the cause of the appendicitis, if the symptoms come on immediately after it; the patient in all such instances, however, was ill before the trauma."

Borchardt states that

"of 150 patients asked on the question of trauma, three blamed traumatism for the condition. One injured himself with a drill several days before, twisting it against the abdomen. One received a blow from a rail, and gangrene of the appendix and peritonitis was found. A third had perforation of the appendix and peritonitis after his small brother jumped on his abdomen in bed."

Neumann states that

"in the presence of a previous attack of appendicitis, an injury, no matter how slight, can easily cause a return of the symptoms and induce an acute attack; without the trauma the condition would most likely have remained chronic. It is extremely doubtful whether an acute appendicitis can be set up in a healthy appendix by a trauma; the small size of the organ and its mobility speak against it. If an appendix contains feces, and particularly a fecal stone, it is easier understood, as then the mucous membrane is already injured, and the injury can readily produce a perforation."

Among 152 cases trauma was mentioned as the cause in 10, 9 had fecal stones.

Sonnenburg states that trauma is extremely rare in acute appendicitis; he noted only 25 cases in which the attack came on after injury.

"The trauma is never proportionate to the gravity of the appendicitis; this is characteristic. Lifting of a heavy object, sudden bending over, a blow against the right side of the abdomen, slipping, fall on back with abdominal muscles tense, concussion during jumping, and riding, are given as causes. It is easily understood to be the cause where a previous attack has been had; but even when no attack is recorded pathologic changes of the appendix have been found after these injuries mentioned as well as after slight ones. Adhesions, sharp twists, fecal stones, and stenosis were the silent witnesses that a larvated or chronic inflammation had existed for some time. The trauma caused an awakening of the already existing inflammation. A trauma can never induce inflammation, perforation, or gangrene in a perfectly healthy appendix on account of its motility and protected position; it matters not how severe the injury. An injury can give rise to a chronic appendicitis, the organ having been perfectly well before. Contusions and hemorrhage in the ileocecal region can produce adhesions which will tie down the appendix. This will predispose to the disease."

Schroth collected 6,698 cases of perityphlitis which occurred in a large portion of the

German army between the years 1890 and 1902. Of these, 44 were alleged to be due to injuries. The injuries are spoken of as direct and indirect. The former include blows with gunstocks, oars, and similar objects against the abdomen; hoof injuries, contusions by being squeezed between horse and wall, etc. The indirect injuries are concussion due to horseback riding or riding on a gun carriage, immoderate exertion, falls while exercising, climbing or jumping, lifting heavy loads, and forced blowing of instruments. Many of the cases had fecal stones and peritoneal adhesions, most of which must have existed before the injury, thus indicating pre-existing appendicitis, either in the form of previous acute attacks or a latent process. The trauma therefore simply renewed the condition already existing.

Adrain

"does not believe that trauma can produce an acute appendicitis in a perfectly normal appendix, nor does he believe that an acute attack can be produced in a chronically inflamed appendix by the trauma. The patient need not have known that he had an attack of appendicitis."

In the cases reported in the literature we are struck by the fact that in a great perentage there is evidence to show there was previous disease of the appendix prior to the injury or strain which the authors asserted to be the cause of the acute attack. In many of the cases no history at all is given to show the presence or absence of previous attacks, and in no case was there evidence of external injury. We may therefore infer that all these cases have had previous attacks. This is proved conclusively by the autopsy or operative findings. In the great majority of the cases in which the pathologic findings are given, there were present old adhesions, fecal concretions, marked angulations, stenosis or foreign bodies.

A short summary of the 130 cases in the literature discloses the following facts:

(1) Age: Twenty cases between 6 and 10; twenty-one cases between 11 and 15; fifteen cases between 16 and 20; fifteen cases between 21 and 25; seven cases between 26 and 30; three cases between 31 and 35; four cases between 36 and 40; three cases between 41 and 45; one case between 46 and 50; two cases over 50; and in 39 the age is not mentioned.

(2) 100 cases were in males and 30 in females.

(3) In 15 cases there was a history of previous attacks; in 35 the previous history was negative, and in 77 the previous history was not recorded.

(4) In 52 cases the nature of the injury consisted in direct blows or kicks upon the abdomen; in 21 to falls upon objects, and in 54 muscular action is given as the direct exciting cause.

(5) In only 3 cases was there recorded any evidence of external injury.

(6) The symptoms of acute appendicitis occurred immediately in 68 cases; within a few hours in 12 cases; within one to two days in 10; within two to three days in 8; within three to four days in 2; within five to six days in 1; within seven days in 4; within four weeks in 2; within five months in 1; and in 16 the time that elapsed is not mentioned.

(7) The evidence of previous disease was shown by the presence of concretions, adhesions, flexions, abnormalities in length, position or size, and stricture is noted as follows: In 43 cases concretions alone, in combination with adhesions in 19 additional cases, and in combination with marked flexion in 8 cases; adhesions alone were noted in 21 cases; flexions alone were noted in 2; abnormalities in length, position or size in 2; foreign bodies in 2; strictures in 2; acute inflammatory conditions alone in 12, and in 29 there is no mention made of the pathologic findings.

MEDICO-LEGAL ASPECTS OF THE SUBJECT.

In cases of appendicitis following immediately or remotely upon a blow or fall on the abdomen, or upon a strain of the iliopsoas or abdominal muscles, the status of the case can be considered only altered by the fact that there were or were not previous attacks of appendicitis as might be adduced from the previous history or that might be proved at operation or autopsy by a thorough examination of the appendix and surrounding viscera. As bearing upon the subject I find in the American and English Encyclopedia of Law (2d edition,

VII, p. 388) the following article on contributory negligence:

2. *Diseased Condition Independent of Injury. Defendant's Knowledge.* But when the diseased condition exists independently of the injury, and does not flow from it as a natural consequence, the defendant's liability is only for such consequences as, independent of the diseased condition, were indirectly or immediately caused by his negligence.

Yet if he knew of the diseased condition and could have foreseen that it would aggravate an injury inflicted by his negligence, he is liable for the entire consequences that flow from the combination of his negligence with the existing diseased condition.

3. *Direct and Natural Consequences.* And so the defendant is liable for negligence causing a natural function or condition to become disordered, and must respond in damages for all the direct and natural consequences, however unusual or unexpected. And this doctrine is particularly applicable when the person guilty of the negligence owes a special duty to the person injured.

Iowa, Dubuque Wood, etc., Assoc. vs. Dubuque, 30 Iowa, 176. Mass., Marvle vs. Worcester, 4, Gray (Mass.) 402. New York, Searles vs. Manhattan R. Co., 101 N. Y. 662, 25. Amer. & Eng. R. Co., 358. Ohio, Reading City Pass. R. Co. vs. Echert (Pa., 1886), 2 Rep. 793.

Injuries to the Person, Actual Physical Injuries. When the injury alleged is to the person of the plaintiff an actual physical injury must be proved. Unless there is actual violence or a positive physical injury to the person or health, there can be no recovery.

Fellse vs. Tripp, 70 Ill., 496; Kellerman vs. Arnold, 71 Ill., 632; Flynn vs. Fogarty, 106 Ill., 263, etc.

The question of negligence enters into the subject to such an extent that if it can be proved that the plaintiff was aware that he had previous attacks of appendicitis and had been advised by a surgeon to have an operation performed, he will be unable to collect damage under the clause of "Injury Enhanced by Disease." If, however, the patient had previous disease of his appendix without any knowledge on his part of such a condition existing, there could be no question of contributory negligence on his part raised. And, again, the diseased condition must be clearly proved to have been the direct result of the injury received.

The following paragraphs deal with the question of accident insurance and its relation with disease occurring "within the system," which may be due to injury:

J. W. May, on Accident Insurance, states definition of accident; injury causing death; strain. What is an accident? This question arises at the very threshold in the consideration of this branch of insurance, and has been and is likely to continue to be a fruitful source of discussion. In the supreme court of Pennsylvania (North American Insurance Co. vs. Burroughs, 69 Pa. St., 43) it appeared that while the insured was pitching hay the handle of the pitchfork slipped through his hands and struck him on the bowels, inflicting an injury which produced peritoneal inflammation, in consequence of which he died, and this was held to be an accidental death. And the same would have been the case, says the court, if a strain had been the cause of the inflammation which produced death. Death by accident was defined to be "death from any unexpected event which happens as by chance, or which does not take place according to the usual course of things." So a sprain of the muscles of the back, caused by lifting heavy weights in the course of business, is injury by accident or violence "occasioned by external or material causes operating on the person of the insured."

Accident: Cause of death arising with the system; secondary cause; external and material cause. "In the case of Filton vs. The Accidental Death Insurance Company (17 C. B. N. S. 122; S. C. L. T. 28 (C. P)), the deceased met with a violent fall by which he immediately became ruptured in the bowels, and afflicted with strangulated hernia in the abdomen, for which a surgical operation was necessarily performed, in consequence of which and the hernia he died. The question was whether this was a death within the exception of a policy which provided that the company did not insure against death or disability arising from rheumatism, gout, hernia, erysipelas, or any other disease or cause arising within the system of the insured, before, or at any time, or following such accidental injury, whether causing

such death or disability direct or jointly with such accidental injury. And it was held that such a death did not arise from a cause within the system, and so was not within the exception.

Proof of Death by Violent, External, and Accidental Means. Under a policy insuring the holder against death or injury by external, violent and accidental means, and providing that the insurance shall not extend to any cause of death or injury unless the claimant shall establish that the death or injury was occasioned by "external violence and accidental means," it is incumbent upon the plaintiff under the policy to show that the death or injury of the insured was the result not only of external violence, but of accidental means.

Several Equally Reasonable Theories of Death. Where the circumstances are consistent with several equally reasonable theories, some pointing to accidental death and some pointing to death from design or natural causes, a case is not made out for the injury until there is some proof offered tending to establish one of such theories. Merrett vs. Preferred Masonic Mut. Accident Assoc., 98 Mich., 338.

Where there is sufficient evidence to warrant a finding that death was due to accidental and not to some other cause, as, for instance, disease, a verdict in favor of the beneficiary will not of course be disturbed. So when there was evidence that the insured died from the effects of a fall, although there was testimony tending to show that typhoid fever might have occasioned death. Standard L., etc., Ins. Co. vs. Thomas (Ky., 189), 17 S. W. Rep., 275.

So where death was found by the jury to have resulted from sudden strain, although there were no external marks of the injury. Owen vs. Travelers' Ins. Co. (Ind.), 12 Ins. L. J. 75.

In the liability of accident insurance companies for disease following injury there are certain facts to be borne in mind. They are: (1) The nature of the policy; (2) certain exception clauses which are found in many policies; and (3), the statements concerning one's health previous to and at the time of the issuance of the policy.—*New York Medical Journal.*

MEDICAL EXPERT WITNESSES.

By Hon. Louis C. Southard, of the Boston Bar.

The position of the medical expert witness in the administration of justice has come to be well nigh intolerable. A few days ago an eminent member of your profession said conditions had come to such a pass that a respectable physician might well hesitate to appear on the witness stand, as he could hardly fail to be conscious that he would be looked upon as a Hessian; that his opinions would be considered as having been bought and paid for by the party who summoned him, and that neither court, jury, parties nor the public in general would give him the credit of being either honest, sincere or unbiased.

While this bitter statement may seem to be overdrawn, yet, it is, after all, not so greatly exaggerated. The recent scandal attaching to the trial of the Thaw case is in point, and the utterances in the public press at the time were so grave that neither the bench, the bar nor the medical fraternity can afford to ignore them.

Every day, in this city, we have the spectacle of medical experts being called upon and testifying positively as to the gravity of the plaintiff's injuries, and then having other experts, looked upon by the public, if not by the court, as equally eminent, testifying that there were no injuries and that the patient was merely suffering from hysteria.

With daily examples such as these, and where it is known that the experts charge enormous fees as compared with other witnesses (and in one way of putting it, as honest men they are bound to give their employers something in return for their money), it is small wonder that *scandal* exists and is bound to increase.

If I had time I should like to quote the utterances of numerous jurists and medical practitioners who have stated even more plainly than I have the difficulties which beset the path of the medical witness.

In England, Lord Kenyon's statement that skilled witnesses are so biased that hardly any

weight should be given to their opinions, still stands as the opinion of the English judiciary.

The Supreme Court of a neighboring State in its written opinion not long since said: "If there is any kind of testimony that not only is of no value at all, but even worse than that, it is that of the medical expert." Utterances of the same nature can be found in the reports of the highest courts of many States.

The judge who wrote the opinion in the case of Winans vs. Railroad Company, 21 How. 101, said "that experience had shown that opposite opinions of persons professing to be experts may be obtained to any amount."

On the Continent alone, notably in Germany and France, have there been practical steps taken to elevate the position of the medical expert.

In Germany the experts are appointed by the court. They are obliged to serve under pain of a heavy penalty. They are allowed their expenses and a reasonable sum for their time and trouble, which is paid by the state. They are not looked upon as witnesses for either party, but as aids to the court in ascertaining the truth of the controversy.

As a result, while the German witnesses sometimes complain of the meagerness of their compensation, which is ridiculously small as compared to the enormous sums often paid to experts in this country, their social position in the community is greatly elevated, and the fact that a physician or surgeon in Germany has been appointed as an expert to testify in any important matter before the court is looked upon as an official recognition of the high standard of his honor and attainments.

As has been cynically remarked, perhaps the very lack of respect in which the expert is held may account for the exorbitant demands they make in this country, money being their only compensation for the indignity of their position.

The *main proposition,* and the one which states the entire case in my opinion is this:

Action which will absolutely assure, so far as possible, the selection of at least one unprejudiced, unbiased, honorable and intelligent medical witness in every case. However many other witnesses might be called for or against, it is certain that the court and jury would have so much respect for the opinion of such a man, on whose integrity entire reliance could be placed, that there would be small occasion for the employment of other expert witnesses.

In Maine there has long been a somewhat similar statute. In matters relating to land titles and boundaries, on the application of either party, the judge is authorized to appoint a court surveyor, whose duty it is to run lines, take note of natural and artificial objects and to make such plans as the parties may call for or that he may deem necessary. The parties are at liberty to employ as many other surveyors as witnesses as they see fit, but in practice after many years it has been found that the court surveyor is almost invariably called as a witness, and seldom any other.

I would voice the opinion of many others in saying that in all human probability the same result would follow if a somewhat similar act was passed by our Legislature in relation to medical experts, and we should not only be spared the humiliating spectacle now so frequent, of the "interested medical expert," but enormous sums of money would be saved to the litigants who often can ill afford this tax upon their slender resources.

What sort of chance does a poor man or woman have in this game of skill against a rich corporation or individual? If a competent medical man should testify in such a case out of pity, he would get no credit for his kind act, but would be considered as a party to a joint speculation with the attorney for the plaintiff.

The *remedy* which I suggested at the recent meeting of your Norfolk District Medical Society is based on the necessity of disturbing the present practice as little as possible in order to accomplish the reform.

It seems to me that this may be done by having the court appoint one or more medical experts whenever such are needed, in substantially the same manner in which masters and auditors are now appointed in this State in civil cases.

Let either side make application to the court, and on good cause shown have the judge appoint one or more experts. If neither side

makes the application, let the court have the authority to make the appointment on its own motion should the judge consider that occasion demands. If both sides agree on one expert, let the court be authorized to make the appointment in its discretion, but not be compelled to accept the choice of the parties should the judge deem it necessary, in the interests of justice, to make a different selection; let the expert or experts so appointed be called to the witness stand and subjected to the same examination, so far as possible, as that now customary.

It would seem to be also reasonable, to provide that on the application of either side on good cause shown, the court expert should have the right and privilege of examining the injured or insane person before the trial.

It should be provided that the compensation of the experts should be fixed in the same way that provision is now made for the pay of masters and auditors.

From the great amount of interest taken in this subject, not only by the medical profession, but the judges and lawyers as well, it would seem that the *times* were nearly ripe for some decided action to be taken.

Mr. President, this is a matter that touches the reputation of the medical profession, and it is your honor which must be guarded.

It is therefore plain that whatever action is taken to mend the present unhappy state of affairs must originate with you, and I need not call your attention to the fact that your action must be united. The matter is in your charge, and may you speedily meet with such success that the position of the medical expert will carry with it that dignity and honor which should attach to an office of so much responsibility.

Your most eminent men are willing to give their time free gratis in hospitals, and for small pay in medical schools, because honor and reputation attaches to such work. Why, then, should you not be willing to give your services to the state for a comparatively small compensation, provided the same considerations of honor attach to the service?—*Pacific Medical Journal.*

TREATMENT OF AN EXTENSIVE BURN WITH RUBBER TISSUE DRESSING.

BY PAUL W. JOHNSON, M. D.

A girl five years old, got too close to a fire. Upon arriving at the house I found the clothing had been removed, and the child was lying on the bed. She did not seem to be suffering much. The burned area extended over the posterior and external surfaces of the upper two-thirds of the left thigh, and the entire surface of the left hip. On the trunk, it extended from a few inches to the right of the spine, around to the left almost to the median line in front; thus covering fully half the surface of the trunk. The left arm and hand were burned over one-half their area. A place was burned on the back of the head about two inches square, and both the ears were blistered. The entire burn, with the exception of the ears and hand, and a margin of about one-half inch around the body burn, was of the third degree. Shock was not marked, but it was sufficient to make the patient almost insensitive to pain. I made no effort to cut away the charred tissue, although this measure is advocated by some. In my opinion it would have increased shock, and this was one of the principal things to guard against. She was rapidly sponged off with a carbolic acid solution, carbolated vaseline was smeared over the surfaces of the burn, and it was dressed with plain gauze and a thick layer of absorbent cotton. No attempt was made to apply a bandage over the cotton, but a sheet was wrapped around her and pinned snugly. She was made as comfortable as possible and kept warm.

Fearing the quantity of carbolated vaseline used might cause poisoning from absorption, the dressing was removed in the afternoon, and plain sterilized vaseline was substituted for the carbolated. This dressing was changed every third day, and answered the purpose until the charred tissue sloughed off and granulation began, when the process of dressing became extremely painful. The child would almost go into convulsions, and, from one dressing to the next, would be terrified at the thought of going through the ordeal. The first question she

would ask her mother in the morning would be whether the doctor was coming that day. If told he was, she would cry and moan constantly. The pain caused her to keep her muscles rigid all the time. Her burned leg was flexed on the body, and her arm was drawn up in a rigid position. It seemed as though, to avoid deformity, it would be necessary to apply splints to straighten the limbs. But these were not the worst features. No matter how carefully the dressings were soaked off, there would be much bleeding. So much, in fact, that the patient emaciated rapidly; and it was evident she would not survive long unless some change was made.

Moist dressings were tried, but these could not be used without disturbing the patient a number of times a day and keeping the bed clothes in a wet, uncomfortable condition.

My attention had been called to the open air treatment of burns according to the method advocated by Sneve, of St. Paul. His method is to leave the burned surface exposed to the air, applying no dressing whatever, except a dusting powder of stearate of zinc to absorb the moisture. In favor of this method of treatment, he claims an alleviation from pain, and much more rapid healing, also freedom from toxemia and contractures. This I tried for one day, only to find that the patient could not endure the suffering, even after the administration of opiates.

On a more careful perusal of this article, it was found that his most brilliant successes were only in burns of the first and second degrees. Those of the third degree were not treated so successfully. Also, the mortality in a series of 63 cases was 14. And of these 63 cases, only 25 were burns extending over one-quarter, or more, of the body. It is reasonable to suppose the deaths all occurred among these 25 cases; thus making a mortality of about 60 per cent.

Skin grafting was proposed, but the parents, for some reason, were prejudiced against it; and the idea had to be abandoned.

Realizing that some change in the form of dressing must be made if the patient's life was to be saved, a special investigation was made on methods of treatment, in order to find some plan that would be less painful and prevent the bleeding which occurred at each dressing. Finding nothing which seemed to be an improvement over methods tried, it was decided to cut loose from all precedent, and try rubber tissue, applied over the wound. This would meet the requirements before mentioned; namely, prevent the bleeding and pain incident to the change of dressing.

The rubber tissue was made to fit the wound as nearly as possible without overlapping the healthy skin, because there was barely enough skin left at the best to carry on its functions, without putting more of it out of commission by occluding any of its pores. Over the rubber tissue was placed a generous amount of gauze and cotton. This dressing proved to be even better than anticipated. When it was changed there was practically no pain, and no hemorrhage whatever. The child allowed her rigid muscles to relax, and her limbs to almost resume their normal position.

The granulations assumed a firm, healthy appearance, and healing progressed rapidly. The temperature remained normal, showing that there was no absorption of toxins.

All the time I had dreaded the effects of the hot summer, but the patient passed through the heated season remarkably well. Her excretory organs were active, her appetite was good, and she immediately began to gain in weight. At the end of three months from the occurrence of the accident, the child's father took charge of the dressings; and, since then, I have called to see her only a few times. She was encouraged to use her injured arm, and to get on her feet as soon as possible to prevent the joints becoming stiff.

Now, nine months after the injury, there is still a small place on the side of the chest which is not healed. But she runs about with the other children; has free use of her arm; stands erect; and does not limp enough to be noticeable.

[Since beginning to prepare this paper, I have found that Woodbury, in The Reference Handbook of Medical Sciences advocates covering the burned area with sterilized rubber tissue; claiming that it acts as a substitute for the destroyed integument, excluding the air, and making an excellent and painless covering.]—*Northwest Medicine.*

Notices and Reviews.

So great has been the demand that W. B. Saunders Company, the medical publishers of Philadelphia and London, have found it necessary to issue another revised edition of their illustrated catalog of medical and surgical books. In looking through the copy we have received, we find that since the issuance of the last edition six months ago, the publishers have placed on the market some twenty-five new books and new editions—truly an indication of publishing activity. The colored insert plate from Keen's new "Surgery," which enhanced the value of the former edition, has been replaced by a new one from the second volume of the same work, and this alone gives the catalog a real value. A copy will be sent to any physician upon request.

"The Operations of Surgery." Intended Especially for the Use of Those Recently Appointed on a Hospital Staff, and for Those Preparing for the Higher Examinations. By W. H. A. Jacobson, M. Ch. Oxon., F. R. C. S., Consulting Surgeon Guy's Hospital, and R. P. Rowlands, M. S. Lond., F. R. C. S., Assistant Surgeon and Surgeon to the Orthopedic Department Guy's Hospital; Joint Teacher of Operative Surgery in the Medical School. Fifth Edition, with 777 illustrations. Philadelphia: P. Blakiston's Son & Co., 1908. Two volumes, octavo; 2,086 pages. Cloth, $12.00 net; Half Morocco, $14.00 net.

The fifth edition of this standard work has just appeared. Much has been added to it and the additions reflect the recent advances in surgery, especially in the matter of abdominal operations.

It is now published in two volumes, the larger of which is fully equal in size to the single volume in which the work appeared in its first editions.

Jacobson's "Operations" has always been most satisfactory in its description of operations whose technic was fixed, such as ligations of arteries in their continuity and amputation, the surgical anatomy being thoroughly considered in connection with each operation and the indications and contraindications discussed. However, the previous editions have been somewhat disappointing in the treatment of the fields in which rapid progress was being made, many of the operations given having become obsolete, and the newer operations which had replaced them in practice not being described.

In the present edition this defect has been remedied and the reader will now find embodied in the work the description of operations with which recent works on surgery and the current literature of the last few years have made him familiar.

Some obsolete operations are described in the present edition, but their historic interest justifies the space given to them.

If one wishes to consult a work where every feature of each operation is fully considered, this work will not disappoint him. As an example of the thoroughness which characterizes the treatment of the various subjects considered, the operation for removal of the breast for cancer is allotted 42 pages.

The number of illustrations has been increased.

For the student, wishing to lay a broad foundation in the subject of operative surgery, as well as for the surgeon who wishes a book of reference, Jacobson's "Operations of Surgery" still remains unsurpassed. S. C. P.

"Gynecology and Abdominal Surgery." Edited by Howard A. Kelly, M. D., Professor of Gynecologic Surgery at Johns Hopkins University; and Charles P. Noble, M. D., Clinical Professor of Gynecology at the Woman's Medical College, Philadelphia. Vol. I, large octavo, 851 pages, with 405 original illustrations by Mr. Hermann Becker and Mr. Max Brödel. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener & Co., 1907. Per volume: Cloth, $8.00 net; Half Morocco, $9.50 net.

This is the first volume of a two-volume treatise on the combined subjects of General Abdominal Surgery and Gynecology, edited by two of the foremost gynecologists of this country.

The preface starts out with the presumptive inference that the development of abdominal surgery has been practically dependent upon the labors of the gynecologists. While it is universally admitted that pelvic surgery has done much to open up the possibilities of work in the remainder of the abdominal cavity, the great advance has in reality been made possible by the wise provision of Nature as to the physiology of the parts concerned, rather than to the

work of the operators, who have confined their work to that region which is notoriously tolerant of trauma of all kinds and degrees.

It is a source of some satisfaction to note that even gynecologists now admit—what has been recognized by the general profession for a long time, viz—that pelvic surgery is in principle no different than intestinal or gall bladder surgery. In fact, pelvic surgery is simply surgery of the lower abdomen, and as such is of the most favorable locality.

It is a matter of regret that the unpreparedness of the operator limiting himself to gynecologic work to properly treat the conditions met in the abdomen as a result of inaccuracies in diagnosis or of unforseen or accidental complications, has been the cause of some unfortunate (and doubtlessly not a few fatal) results in abdominal work.

In consideration of the specialized function of the pelvic organs, one would naturally be inclined to endorse the conservative attitude which has been maintained by the general surgeon for many years relative to the removal of the reproductive organs, but strangely the gynecologists as a class have been the most radical in their mutilating operations, and have been the last to appreciate the importance of conservatism in treating diseases of these organs.

While the gynecologist may be warranted in claiming considerable credit for his initiative in abdominal work, he must at the same time admit that the so-called conservatism of the general surgeon has been valuable as a balance wheel to the natural enthusiasm which sooner or later possesses the specialist in any department of medicine.

In view of the facts that the leading gynecologists appreciate the identity of the principles of all surgery in the abdomen, and that competent gynecic operators are becoming very numerous, we are not surprised that they should want to annex the rest of the abdomen to the field of their operative dexterity.

The appearance of this large work on gynecology and abdominal surgery under such commanding editorship should do much to efface that purely artificial and useless wall with which the gynecologist has heretofore attempted to enclose the pelvis as his exclusive territory, and will therefore do much toward preventing petty jealousies and for the unification and advancement of the surgery of the whole abdomen. While succh a plan portends the elimination of gynecology as a specialty, such a result can not help proving beneficial to the profession as a whole, and particularly to female patients generally.

This volume is devoted to gynecologic subjects. Dr. Kelly contributes the chapters on Gynecologic Technic, Vesical Fistulæ, Vaginal Drainage for Pelvic Abscesses, Conservative Operations on the Ovaries and Tubes, and, with Dr. Hurdon, the chapter on Operations Before Puberty.

Dr. Noble contributes the chapters on Plastic Operations, etc., The Preparatory Treatment of Celiotomy Cases, After-Treatment of Celiotomy Cases, The Celiotomy Incision, Operations for Retrodisplacement and Prolapse, Abdominal Hysteromyomectomy, and Vaginal Myomectomy, and, with Dr. Anspach, the section on Medical Gynecology.

These chapters are presented with that degree of thoroughness, scientific accuracy and forceful diction which has characterized the contributions of both of these gentlemen. Other chapters have been contributed as follows:

Dr. W. W. Ford, of Johns Hopkins University, contributes on Bacteriology; Dr. Elizabeth Hurdon, of Johns Hopkins Hospital, on Pathology of the Reproductive Organs; Dr. G. C. Hunner, of Johns Hopkins, on Diseases of Bladder and Urethra; Dr. J. G. Clark, of University of Pennsylvania, on Radical Hysterectomy for Cancer of the Uterus; Dr. Anna M. Fullerton, of India, on Non-Plastic Operations of the Vulva and Vagina; Dr. G. M. Edebohls, on Combined Gynecologic Operations; the late Dr. A. J. C. Skene, on Ovariotomy; Dr. Henry T. Byford, of University of Illinois, on Vaginal Section for Diseases of the Ovaries and Tubes; Dr. J. Clarence Webster, of Rush Medical College, on Removal of the Uterine Appendages; Dr. J. M. Baldy, of Philadelphia, on Abdominal Hysterectomy for Inflammation of the Uterine Appendages; Dr. X. O. Werder, of Pittsburg,

on The Byrne Method of Treatment of Carcinoma of the Uterus, and the late Dr. F. Henrotin, on Vaginal Hysterectomy.

In Kelly's chapter on Gynecologic Technic forty-three illustrations are presented, the devisor's name, excepting his own, being mentioned in only five instances. It would have been better to have given the devisors credit in each instance, or, instead, to have simply stated that those shown were such as the author used or recommended.

The chapter on Bacteriology is excellent, but one cannot readily understand why it should have been limited to the diseases of women in a treatise taking up other diseases and the bacteriology of which could very easily have been included.

Dr. Hurdon's chapter on Pathology deserves special mention. The 130 pages which it occupies comprise the best presentation of the subjects which it has been our privilege to read.

To the subject of Medical Gynecology over 100 pages have been devoted. The various diseases, conditions and complaints are fully considered on broad, sensible lines and the indications for different plans of treatment as well as to details are presented in a clear, wholesome and satisfactory manner.

One is favorably impressed throughout the book with the historical data given. This not only makes its reading more interesting, but enables one to study the references in their completeness and at the same time impresses the reader with the magnitude and value of the contributions of Americans to the surgery of the region. In presenting the relative value of the vaginal and abdominal routes, staunch advocates of each were selected, and as the presentations are very clear and full, one can consider the subject as discussed from a comparatively authoritative standpoint, and can thus more readily arrive at his own conclusions as to the indications in his own individual cases.

Every chapter in this volume is very full and complete, and contains an immense amount of matter which is not presented in the ordinary text books. The presentation is exhaustive and, being thoroughly up-to-date, it comprises the best recent contribution to the literature of gynecology.

The work of the artists is uniformly good and the press work is excellent. A. I. B.

"Abdominal Hernia, Its Diagnosis and Treatment." By W. B. De Garmo, M. D., Professor Special Surgery (Hernia) New York Post-Graduate School and Hospital, etc. Philadelphia and London: J. B. Lippincott Co., 1907. 458 pages, 226 illustrations. Cloth, $5.00 net.

This new volume will take a higher rank as a text book on hernia than any similar treatise by American authors. It is so divided as to give in a concise and lucid form the surgical anatomy, types of hernia, diagnosis, mechanical and surgical treatment. The chapter on truss fitting will be of especial interest to the general practitioner as well as the surgeon, since Dr. DeGarmo is master of this field of surgery. The chapter devoted to surgical cure will furnish interesting reading, not only for the surgeon of limited experience, but to the specialist as well. The technic as given is clear and brilliant, and beautifully illustrated by a large number of drawings, woodcuts and half-tone photographs, so accurately shown as to supplant the demonstration on cadaver or in the clinic.

The general excellence of this book makes it essential to a complete library. The mechanical treatment of inguinal hernia in infancy and childhood, the care of skin to prevent irritation by truss, the preparation of patient for operation, complications in surgical cure, etc., leads us to say that it is the best treatise on the subject that we have had the pleasure of reviewing. The book is extremely well gotten up, and will serve as the most practical and helpful text book to be found among the large number on this subject.

E. S. McDonald,

Cancer of the pancreas is of very great interest because it is in itself very insidious, and rarely becomes clinically recognizable except from what may be termed an accident in its environment, namely, the disease is very prone to attack the head of the gland, and cause jaundice by obstructing the common bile duct.—*Bland-Sutton.*

Notes of Societies

NORTHWESTERN RAILWAY SURGICAL ASSOCIATION.

One of the most notable gathering of physicians ever held in the Northwest took place in Huron yesterday when surgeons of the Northwestern road held their first annual meeting and perfected a permanent organization. Primarily it was intended only for those in the Huron District, but grew beyond expectation and now embraces the entire C. & N. W. system. Present were:

Dr. Owens, Chief Surgeon of the North-Western Railway, of Chicago; Dr. W. J. Mayo of Rochester, Minn., District Surgeon for Minnesota; Dr. H. A. Sifton, Milwaukee, District Surgeon for Wisconsin; Dr. J. L. Foxton, Huron, District Surgeon for South Dakota; Dr. Workman, Tracy, District Surgeon for Minnesota; Dr. Cox, Tyler; Dr. Blackman, Geneva; Dr. Robinson, Pierre; Dr. Wallace, Miller; Dr. Burnside, Highmore; Dr. Dyer, DeSmet; Dr. Kutnesky, Redfield; Dr. Edgerton, Faulkton; Dr. McNutt, Aberdeen; Dr. Chichester, Redfield; Dr. Dott, Salem; Dr. Boyden, Brookings; Dr. Campbell, Watertown; Dr. Hargens, Hot Springs; Dr. Giffin, Rapid City; Dr. Freeman, Lead; Dr. Howe, Deadwood; Dr. Townsend, Belle Fourche; Dr. Rodgers, Yankton.

The first session was called at 11 o'clock at the rooms of the Commercial Club and the first business, that of perfecting an organization, which was done by selecting the name of "Northwestern Railway Surgical Association," and electing the following officers:

President—J. L. Foxton, Huron, S. D.

First Vice President—H. A. Sifton, Milwaukee.

Second Vice President, W. J. Mayo, Rochester, Minn.

Secretary and Treasurer—H. E. McNutt, Aberdeen.

Executive Committee—J. E. Owens, Chicago; Doctors Campbell of Watertown, Hargens of Hot Springs, Coit of Norfolk, Neb., and Fairchild of Clinton, Iowa.

Dr. J. E. Owens, Chief Surgeon, made a brief opening address, in which he stated the object of the association and the good he expected would come from it. "Should an Injured Employe be Allowed to Resume Work Without the Written Consent of his Surgeon," was the title of a paper presented by Dr. Hargens of Hot Springs, and was discussed by Doctors Sifton and Foxton, Claim Agent Richards and Superintendent Moulton, after which an adjournment was taken until 2 o'clock p. m.

At the afternoon session subjects were taken up and discussed as follows:

"The Company's Surgeon in Relation to Other Surgeons in Private Practice, with Special Reference to Persons Injured by the Company," Dr. McNutt, Aberdeen; discussion by Drs. Hagen, Owens and Claim Agent Richards.

"Should the Railway Surgeon Render Surgical Aid to an Injured Employe Without the Written Order from Someone in Authority," Dr. Robinson of Pierre. Quite an animated discussion followed the reading of this paper by Drs. Workman, McNutt and Owens.

"Venereal Diseases," Dr. Boyden of Brookings; discussion by Drs. Chichester and Mayo.

"Surgeon's Relation to the Claim Department," Dr. Campbell of Watertown. The paper was a most excellent one, thoroughly enjoyed by all present and showed the perfect accord existing between the surgical and claim departments of the system.

"The Relation of the Claim Department to the Surgical Department," R. C. Richards, general claim agent. These papers were discussed jointly by Drs. Workman, Hagens and Owens.

"Should the Patient be Brought to the Surgeon or Should the Surgeon go to the Patient?" Dr. Mayo, Rochester; discussion by Drs. Sifton, Owens, Cox, Workman, McNutt.

An informal talk with some radiographic illustrations of fractures and dislocations was then given by Dr. J. W. Freeman of Lead. So complete was the talk and so painstaking was Dr. Freeman in the presentation of the radiograph that he was tendered a rising vote of thanks for his efforts and trouble in preparing the exhibition.

The meeting then adjourned to meet in Chicago next year at a time to be designated by the Executive Committee.

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The Storm King I bought of you last March (1905) has proven to be one of the best investments I ever made, for we have had an exceptionally rainy spring and summer. I would not part with it for ten times what it cost me, and do without it. W. C. BUKEY, M. D., Ashley, O.

The Storm Buggy is one of the best protectors from the cold and wet weather I have ever seen. I really would not do without it. The quickness and convenience with which it can be closed from the inside makes it a most desirable vehicle.
A. K. BELL, M. D., Madison, Ga.

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PUBLISHER'S DEPARTMENT

THE ACTION OF COLLARGOLUM.

Bacteriologic investigations published of late have called renewed attention to the acknowledged fact that, *in vitro,* collargolum has no such bactericide powers as silver salts, such as the nitrate. As this fact has led to *a priori* denials of its clinical efficacy, permit us to point out that the indubitable therapeutic action of the remedy—demonstrated by almost 400 publications—is not dependent on germicide properties.

By reason of its colloidal nature, collargolum has vigorous catalytic effects which induce or enhance the processes of oxidizing bacterial toxins in the organism. This fact was proved experimentally by Schede, Hamburger, Robin and others. Prof. Solis Cohen (*Jour. Amer. Med. Asso.,* Oct. 20, 1906) stated:

"It is quite probable that the therapeutic value of colloidal silver is largely due to catalytic action in taking up and again yielding oxygen, thus destroying toxins, bacteria or diseased cells—a chemical amboceptor action, to take an illustration made familiar by Ehrlich—and through such action it may prevent or retard sepsis. It certainly has a definite therapeutic action and should be employed more extensively in larger and more frequent doses."

An exhaustive study of the leucocytogenic action of collargolum was recently published by Dunger (Archiv f. klin. Medizin, 1907, Vol. 91, No. 3-4). He found that an intravenous collargolum injection was immediately followed by hypoleucocytosis. One or two hours later a hyperleucocytosis always occurred, usually up to 130 to 150 per cent, with a maximum of 260 per cent. After 20 to 24 hours the number sank to its original figure. He explains it as due to the destruction of neutrophiles, the later rise being an overcompensation of the defect from the bone marrow. The collargolum leucocytosis is favorable, because of the phagocytosis, by which microörganisms are taken up and destroyed and inorganic bodies, such as silver particles, are carried outside the blood current, as to joint cavities. The marrow irritation occasions a stimulus to the formation of immunizing bodes. The leucocytic decomposition, setting free proteolytic ferment, is probably of the greatest importance for the solution and resorption of inflammatory exudations, especially of pneumonic infiltrations. This is confirmed by the author's experience with collargolum in a series of pneumonias.

That collargolum stimulates the formation of leucocytes, especially of the large, multinuclear forms, was also demonstrated by Rodsewicz, Achard and Weil, Ceresole, French, Widal and others.

When done under conditions closely simulating a clinical sepsis, animal experimentation with collargolum has always given favorable results—as the reports of many veterinary surgeons on the successful use of collargolum in infected horses, cows, etc., show. An artificially produced infection is, however, not analogous to one which occurs naturally; the intravenous injection of highly virulent bacterial cultures is far more brusque than the gradual development of a clinical sepsis. Moreover, in all laboratory experiments in which collargolum was administered to the animals simultaneously with the infectious material, a negative result was to be expected, since the remedy is rapidly eliminated and had thus passed out of the body when the infection reached its height. Experimenters who waited with the administration of collargolum until the animals showed violent signs of illness saved them (Beyer, Pinto and others). SCHERING & GLATZ.

A PALATABLE COD-LIVER OIL PREPARATION.

The day for nauseating combinations of drugs has passed, this state being brought about by the ability of chemists to present an efficient yet palatable product. All things being equal, that combination which is pleasing to the taste will meet with much more favor at the hands of

physicians than another of equal potency but less palatable.

This rule is especially applicable in the case of preparations containing cod-liver oil, a remedial agent that will long continue to be a favorite with physicians. The many pathologic conditions that will respond only to cod-liver oil, showing its great worth, have put chemists on their mettle to prepare combinations in which are incorporated all of the virtues of the oil with the disagreeable features eliminated.

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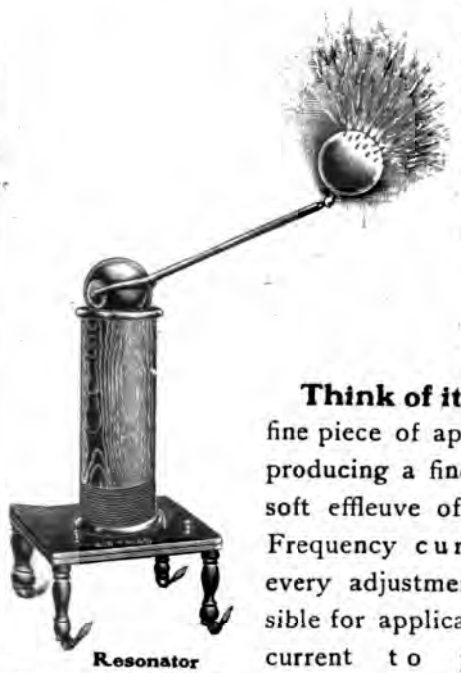

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THE Railway Surgical JOURNAL

VOL. XIV—No. 5 CHICAGO, JANUARY, 1908 WHOLE NUMBER 260

THE NECESSITY OF THOROUGH EXAMINATION OF APPLICANTS FOR RAILWAY SERVICE.*

B. C. BRETT, M. D., GREEN BAY, WIS.

It should be understood that whatever is presented in this paper relative to the tests for the special senses of sight and hearing, is not stated from the standpoint of the specialist, but from that of the general practitioner and railway surgeon.

Notwithstanding the fact that very able papers have been read at the meetings of this Association, touching upon the subject announced, there still remain some features of it which it may not be unprofitable to consider, and among them may be prominently mentioned the surgeon's mental attitude on the subject. Having served as surgeon in the army during the Civil war, and since as examiner of recruits for the U. S. Army, as examiner for many life insurance companies, and having served as surgeon of the C. & N. W. Railway for over twenty years, I am in position to assert that the responsibility of the examining surgeon of a railway company far outweighs that of either of the other positions mentioned. The result of this work is far reaching. It affects, not alone the company which employs him, but the condition of the man examined, in that it is likely to determine his life employment. It also affects the future safety of the man himself, as well as that of his fellow workmen. And lastly—and more important than all else—it affects the general public, those thousands who patronize the road, and determines in great degree, its safety.

These premises being admitted, it follows that the surgeon who undertakes the examination of railway employes should possess not alone a high degree of professional skill, but, in addition, he should have certain high mental and moral qualifications, such as well-known habits of temperance, absolute honesty and such a realizing sense of weighty responsibility as would compel thoroughness, method and exactness in every detail of his work. Not only this, but, as the only object and aim of the company in instituting surgical examinations is, as far as possible, to avoid the occurrence of accident, death and destruction of property by the exclusion of unsafe men, he should be in full and hearty sympathy with the object to be accomplished in which he is so important a factor, and strive to attain to the ideal in the results of his professional work.

Only the man who is thus equipped, professionally, mentally and morally, is properly fitted to become the examining surgeon of a railway company. And then, in order to have a proper appreciation of the real life and actual necessities of a locomotive engineer or trainman, in regard to visual acuteness, color sense, acuteness of hearing and general alertness of mind and body, let him make several excursions, by night and day, in sunshine and sleety storm, in the cab of an engine of a fast passenger train. Such a man as I have described, after such an experience, would never be found careless, or in any other way wanting in the thoroughness of his work. He would be so fully imbued with the importance of the ob-

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

jects to be attained that the rules formulated for his guidance would become as familiar to him as the alphabet; and, if mistakes should ever occur, they would be errors of judgment and not of carelessness.

While it is probably true that all of the larger railway companies have adopted some system of examination of its employes, I regret to state that some of the smaller roads have made no such provision. The reason given by an official of one road, of which I am surgeon, is that its trains run slower and are less numerous, and that the men are not rushed and take more time in handling trains than is the case on larger systems; hence there is less liability to accidents. Of course, other things being equal, it is true that the fewer the trains and the less speed, the fewer the accidents. This was always the case both before and since examinations were in vogue; but it is no argument that sound men are not as advantageous on small roads as on large ones. This same official told me that "only yesterday" a man with a glass eye applied to him for a position as switchman and, if he had not personally known the man, he might have accepted him. This simply shows that on the smaller roads, the men being better known to the officials, the help of the surgeon in determining their fitness is not deemed necessary.

The rules now in use by the surgeons of the C. & N. W. Railway Co. were issued by the chief surgeon, Dr. John E. Owens, on January 1, 1900. In some respects, I believe them better than those adopted by the American Railway Association, April 5, 1905.

These rules divide the employes into but two classes. The first class corresponds closely to class "A" of the Association. The second class embraces all employes not specified in the first, and corresponds to classes "B," "C" and "D" of the Association, thus avoiding the confusion of several classes.

The rules of this road oblige the applicant for commencing service in the first class to have 20/20 vision in each eye; whereas the rules of the Association, in the first class, or class "A," allow a vision of 20/20 in one eye and 20/30 in the other! a retrograde movement. Inasmuch as it is the policy of all well-managed companies to retain good men in service for long terms, and, as diminishing visual power is the natural accompaniment of advancing age, it would seem the part of wisdom to limit the admission of applicants for commencing service in this class to 20/20 vision in each eye, without glasses.

By the rules of the C. & N. W. Railway, applicants for commencing service in the second class "may be accepted with 20/40 visual power in one eye, provided that the other eye be normal, or with 20/30 in each eye (without glasses).

Firemen and brakemen (first class) examined for promotion, may be accepted with 20/20 in one eye and 20/30 vision in the other, provided they have not other defects (without glasses).

Thus, it seems, that the rules in use by surgeons of the C. & N. W. Railway for promotion of those in the first class, are the same as those of the Association for promotion in class "A," while the requirements on this road for entrance in this class are stricter.

It is also seen that the visual requirements on this road for commencing service in the second class is nearly the same as that in class "B" of the rules of the Association, but for the classes "C" and "D" of the Association, which the second class of this road embraces, the rules are stricter than those of the Association, less confusing, and, as I believe, better.

I can see no objection, however, in cases of long service or promotion of employes in the second class to the use of glasses which would bring them to the required standard. Indeed, it is gratifying to observe in some of the recent literature on the subject of glasses for engineers and others occupying places of responsibility in the service, that opinions have been expressed decidedly favorable to their use for old employes, not only to bring vision to standard requirement, but as a protection from the disabling effects of cinders and dust to which the men are constantly exposed. While I believe this to be a movement in the right direction, it is one to be tried with caution; and certainly one not to be advocated for beginners in service of either class.

A personal experience recently undertaken

in the cab of a fast passenger engine for the purpose of ascertaining the degree of protection to the eyes which large plain glasses afford, enables me to speak very approvingly of them for engineers and firemen on fast trains. I think their more general adoption for men in certain kinds of train service should be allowed.

The equipment for visual tests in the service of the C. & N. W. Railway has not been changed since 1900, and consists of one card of Snellen's test letters of size ranging from 10 to 200. The card is placed in a good light, 20 feet from the applicant's eyes, the 20/20 line on a level with them. He is then made to read the various lines from left to right and from right to left with each eye, the other being covered. The last five letters of the line of smallest type read with either eye, and that read with both eyes correctly, are noted. I feel certain that I have never been deceived by an applicant in making a test by this card. In dark days if the applicant fails with either eye to read 20/20 I defer the test, in the interest of fairness, to a fair day. Good artificial illumination of the card may be a desirable substitute for sunlight. I have made a few tests with this light when evening was the only time at applicant's disposal, and was satisfied with the result.

For testing the color sense, surgeons of the C. & N. W. Railway since 1900 have used the colored worsteds then distributed to them from the office of the chief surgeon, and they are the same as has been adopted by the Association. They consist of three groups, "A," "B" and "C." The combination numbers 40, one-half of them being true colors and the other half confusion colors. The true colors have even numbered tags, the confusion colors the odd numbers. Group "A" contains 10 of green of various shades, and 10 of confusion colors. Group "B" contains 5 shades of pink, and 5 of confusion colors. Group "C" contains 5 shades of red and 5 of confusion colors. The applicant is given the sample of group "A" and asked to select all of the different shades of that color. Then sample of group "B" is taken and he is asked to select the right colors for it. And the group "C" is taken and the true colors looked for. I find a proportion of applicants who do not comprehend the test and become confused. For such persons, I rapidly select the ten true colors of group "A" turning the tag numbers down so as not to be read. Immediately thereafter I mix them with the other thirty. After this example, if the applicant's color perception be normal, he will promptly and correctly select the correct shades of color of the three groups. But if he is color blind, the example given will not help him to select the proper colors. I have no doubt of the superiority of the lantern test, but so far as I know, it has not been used on this road.

The watch, as a test for acuteness of hearing, is a snare and a delusion, and I believe its use might well be discontinued. No two watches have the same intensity of sound, and the noise of the street, and even the direction of the air currents causes considerable variation in results with its use. While this test is retained in the rules of the C. & N. W. R'y, it is supplemented by the loud whisper and voice of ordinary conversation. If the applicant correctly repeats numerals spoken in ordinary voice and loudly whispered from a distance of 20 feet, his hearing is registered by the fraction 20/20 as normal. If he cannot repeat them correctly at 20 feet but can do so at 10 feet, the record stands at 10/20, the numerator of the fraction indicating the number of feet at which the applicant repeats correctly.

In the literature of the subject of the examination of applicants for railway employment, so much stress has been laid (and very properly, too) on the tests for sight, color sense and hearing, that the body in general is in danger of neglect. It goes without saying, that a sound mind in a sound body is as essential to the successful working of a railroad, as is normal sight and hearing.

The rules of the C. & N. W. R'y Co. are none too sweeping in its list of disqualifying defects, but they are broad enough to enable the careful surgeon to read between the lines that only physically sound men can be accepted.

Although I have often thought of the desirability of uniformity in methods of examination, I have never had the privilege of observing the work of others in this line. My own method, in brief, is as follows:

After making the tests for vision, color sense and hearing, in the manner prescribed by rules before mentioned, in order to best discover any physical defects, the applicant is divested of all clothing, and, in a room well lighted, is systematically examined from head to foot. The scalp, teeth, tongue, skin, muscles, tendons, veins, spine, bones and joints to the ends of the fingers and toes are examined in the order named, and all conditions noted. Then follows examination of lungs, heart, abdominal organs, inguinal regions, including the genito-urinary organs; and when all conditions, and certainly all defects, whether disqualifying or not, are noted, the examination is complete. Evidence of recent successful vaccination or re-vaccination by the examining surgeon (unless such order is temporarily suspended) is a necessary condition of acceptance.

Most certainly the rules of any railway company should disqualify any applicant who is suffering from any acute or chronic local or general disease. Syphilis, gonorrhea and their sequelæ should always disqualify, and so should any organic disease of the lungs, heart or any of the abdominal viscera. The nervous system should be carefully examined for evidence of any disability which would be likely to impair the present or future usefulness of the applicant.

In view of the enforced irregularity of meals and the short time allowance for eating, frequently unavoidable, the digestive system should not be overlooked. The absence of many natural teeth (unless supplied by artificial ones) or the presence of many decayed ones should cause suspicion of some constitutional disease or feebleness, and should therefore be a disqualifying defect. External hemorrhoids or slight varicocele (not uncommon with young men otherwise healthy) should not disqualify.

Any variety of hernia, either fully or partially developed, should disqualify. And it should be remembered that an oblique inguinal hernia which is just presenting, or is nearly ready to present at the external abdominal ring, may be easily overlooked. In illustration, allow me to state that in 1895, in an examination of an applicant for commencing service on the C. & N. W. R'y, I failed to detect a hernia, sending in my report that I found no disqualifying defects. When, several months later, this man again appeared for treatment of an injury, I discovered that he wore a truss, and inquiry brought out the fact that this hernia existed when he was examined, several months before. Here, certainly, was a well-developed hernia and I was both surprised and chagrined at my evident mistake and at once reported the facts to the chief surgeon. Such honesty as this man exhibited deserved reward. He is still in the company's employ.

In contrast with the incident just related is the following which I ask permission to relate and your pardon for the digression. On February 11, 1907, a brakeman on a logging train presented himself stating that on the 9th —two days before—in going from one car to another, he stumbled and fell, striking his abdomen against the end of a log and producing a lump which he thought was a breach. Careful examination gave no evidence of trauma. There was no tenderness over the external or internal abdominal rings, along the canal or above it, at the point where the abdomen, as he claimed, struck the log. The finger easily and painlessly entered the external ring. There was distinct impulse on coughing and a decided hernial protrusion on assuming the upright position. As the case was interesting, I called in my associate, Dr. T. J. Oliver, who concurred in the diagnosis of right oblique inguinal hernia of some months' standing. I told this man I thought the hernia was present before the occurrence of the accident described, and explained to him the reasons why it would be a difficult matter to convince the company officials that this hernia, so easily reduced, and so easily and painlessly reproduced, was the result of injury sustained two days before. I directed him to rest in bed for two days, then to return for re-examination. He never returned. I know nothing of his further history, but I am convinced that the examination, my explanation and plain language, saved the company from the annoyance of defending a damage suit.

Gentlemen, I should not longer tax your patience. I am aware I have presented nothing new to you; but if I have succeeded in placing in any stronger light the importance of thor-

ough physical examination of those about to enter railway employment, I am content.

THE FIRST CARE OF THE INJURED.*

D. W. BEATTIE, M. D., NELIGH., NEB.

In taking up this subject I shall try as far as possible to eliminate technicalities, and try to take up the management of the injured as we find them, especially those injured either as employes or passengers of railway company. The subject is an old one but is of the utmost importance. The first dressing placed upon a wound may decide the fate of your patient.

In case of wounds, they will be encountered in all the varieties described in the books, or several of the classifications may be encountered in one patient. The wound may have the appearance of cleanliness or may contain in and around it foreign material of different kinds, as dirt, grease, cinders, pieces of wood, pieces of clothing, in fact particles from anything which may be in contact with the part receiving the injury, or upon the instrument inflicting the injury. Beside all these we may find other things which have found their way from the hands of well-meaning but ignorant friends. Among these may be mentioned fine-cut tobacco, moistened with saliva, wheat flour, cobwebs, etc. Any of these may have been applied and retained in position by a piece of cloth which is anything but clean. The patient may be unconscious, semiconscious, hysterical, or calm and rational. Remember in many cases the nervous condition has a marked tendency to mask the true condition.

Again the unfortunate patient may be in a dying condition. It will be impossible to give any one rule which will fit all cases as sometimes we will have to make the treatment just as brief and just as simple as possible on account of the extremely unfavorable surroundings and the condition of the patient.

We come into the presence of the patient, and my first injunction will be—Don't talk too much. Every one will be listening to what the doctor will say, and every word you utter will be repeated and probably the additions and colorings will be plentiful. And if it is a railway case you may say things before you know it which will almost invite litigation.

It is of great importance first that you ascertain the extent of the patient's injuries and locate other and unsuspected injuries should they exist, as it would be very embarrassing to have your attention called to an unsuspected fracture or dislocation a few days later. And let me say right here that such things have occurred, and do occur, and are not as infrequent as one might suppose.

On your arrival you should first take a good look at your patient, many times much can be learned by painstaking observation. And here it is well if possible to begin taking notes of the case in writing. Strengthen this observation by an examination.

First—rate and quality of pulse, and next, if conditions will permit, the patient should be stripped for physical examination of every portion of the body and extremities, keeping careful record of evidence of former injuries, as well as those caused by the accident for which you were called.

As soon as convenient after the injury examine a specimen of the urine and let this be made a part of his record. I remember a case in which the railway company paid $3,500 which could have been avoided if urinalysis had been made.

We must not lose sight of the fact that we may be called to cases where the surroundings will be such that the best we can do will be to give the patient the immediate care which is necessary for his removal, and it will be impossible to strip him. This would be true in the open right of way or in a cold and dirty station.

We will now take a few of the conditions which we may find and try to make their discussion as practical as possible:

Arrest of hemorrhage.—Many cases yield readily to pressure and are a small factor in the management of the case, while in others it is more or less troublesome especially if the patient has already lost a considerable quantity of blood before he comes under the care of the

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

surgeon. However, many of these troublesome cases resolve themselves into a simple matter when the proper course is taken. Position will often be found an important aid. By elevating an injured limb a hemorrhage which has been exceedingly obstinate may be easily controlled. I have seen a wounded posterior tibial artery which has resisted packing and pressure stop bleeding at once when the limb was placed in a sling and elevated. Immediate packing may be necessary, and a word as to the manner in which this should be done in emergencies will not be out of place. Every emergency bag should contain sterile gauze, and it should be in a shape convenient for use with the least possible danger of the gauze becoming reinfected, before the surgeon can place it upon or within the wound. I make it a rule to always have at hand small rolls of sterilized gauze which are wrapped in a paper and the paper placed in a gelatin capsule and hermetically sealed. This capsule can be cut with a knife and the package removed. Now unwrap the paper with one hand while the package lies in the palm of the other hand. Then by inverting the hand containing the gauze you will have applied it without having touched the gauze with your hands at all.

Suppose the wound and its surrounding skin has to be cleansed before you can even put on a temporary dressing, you will find ordinary spirits of turpentine one of the best agents for removing dirt and at the same time one of our very best antiseptics.

In some instances a dish of some kind is very badly needed and a little trick in sterilizing the same is of importance. Select a dish which will answer your purpose and pour a little alcohol in it and ignite the alcohol. If forceps are to be used as for picking particles of foreign matter from the wound they may be passed through the flame several times and then dropped into the dish. This could be done with any small instrument.

Another little technical point in the cleansing of the wound. Always wipe away from the wound so you will not bring infectious material from distant parts and introduce it into the wound.

Be gentle with every patient. They are suffering enough without any additional suffering caused by rough handling and manipulations.

Pain may be an important factor in the production of shock which is present in many of these cases. A hypodermic of morphin by quieting the pain and reducing the irritability of the nervous system will strengthen the action of the heart, reduce the evidence of shock and render the patient more quiet and comfortable.

Fractures may exist which must receive temporary attention. Place the fractured member in a position as nearly normal as possible and it will usually be moderately comfortable. The next effort should be to retain it in this position by some form of splint and as to the kind you will be governed largely by the material at your disposal. A pillow, articles of clothing, blankets, anything you can get hold of, and if necessary stiffen them with pieces of stiff wire, pieces of board, withes, or anything which is at hand, binding all under the limb and around it in such a manner as to retain it in a comfortable position and at the same time prevent further laceration of the soft parts.

You may find the patient in collapse and rapidly approaching dissolution. Many times the surgeon seems to be the only person who is not excited. The dying need our attention. Place them in a comfortable position and let the surroundings be quiet. Let the bystanders see that we are interested in the case although it may be hopeless.

The unconscious and semiconscious patient—these cases should receive the most painstaking attention. Note very carefully the rate and quality of the pulse, watching for the slow pulse of cerebral pressure, and the fluttering thready pulse of shock or hemorrhage. Examine the pupils carefully, as that is one important sign in cerebral injury.

To recapitulate.—Always keep careful notes, make careful examination both for recent injuries and evidence of former injuries, be clean, be prompt, be painstaking, and be gentle.

DISCUSSION.

Dr. J. D. Milligan, Pittsburg, Pa.: I only want to stand corrected on one point in Dr. Beattie's paper. He states the first thing to do is to take note of the patient—his pulse, respi-

ration, etc. But while we were waiting to do that the patient might bleed to death. Therefore I do not believe I fully understood what he said in this regard. There is a whole lot to do before we begin to take note of the patient. Of course, in the case of an hysterical patient any time will do, and we can make our memoranda first. But if it is a bad injury—a crushed limb with profuse hemorrhage, shock attending it and all the other troubles that arise in railway injuries—don't wait to write down too much, but get busy and do something for the patient and then do something for the company you represent. Damage suits, of course, follow as the doctor says, and I know that I as well as the rest have made untimely remarks in the presence of the friends of the patient which tend to encourage the patient to think he can recover $10,000 or more. But the time to get busy on that feature of the case is to get busy with the hands and mind and not talk; get the patient in a safe condition and then take care of the friends.

I liked the technic outlined by Dr. Beattie as to what to do with these wounds, in fact I liked the paper all the way through, and think the doctor has a very fruitful field before him. The mills grind pretty slowly, and sometimes they grind lots of stuff into us, but after many years' experience we will find that we should take care of the patient first and the notes afterward.

Dr. E. S. McDonald, Cameron, Mo.: As Dr. Milligan has just said, we cannot always take time to make notes of what has occurred, until after the patient has been taken care of. There is an indication in addition to that suggested by the last speaker (hemorrhage), which is pain. Pain sometimes demands immediate attention, and, while it is not written in any book, pain will kill, and in many cases this is the first indication for treatment. The doctor's paper has in it much to praise and little to criticize, and on the whole were we to follow it we would do well I am sure. But this thing of taking a statement when it is given with the hope of gaining something from the corporation, I should put aside entirely.

Only a few days ago I was taken to see a patient 25 or 30 miles from my home, who was alleging an injury to his wife by the train starting before she was seated. The husband had told a merchant a few minutes before I arrived with an attorney for the railroad, that his wife was severely injured, her hip badly bruised, swollen and black, a tumor in her side of tremendous proportions, etc. When I was introduced to the gentleman I told him that I knew his brother, who was a doctor. I went with him to his house and found his wife in the kitchen doing her housework, sweeping, etc. After we had visited together for a while he seemed to have more confidence in me than at first, and finally said, "Now go ahead and examine my wife." I examined her carefully and the only mark or indication that she had met with an injury was a small place about the size of the end of my thumb, showing a pale discoloration, but new. There was no limitation of motion, nothing to indicate that she had been injured. In a day or two I received a letter from him, which letter I have in my pocket but will not read. Suffice it to say that suit is based upon the claim that the alleged injury has destroyed or impaired the sexual function. His age is 65, while she is perhaps a few years younger.

So these phases of the matter we cannot always follow up. But we must first look after the patient's comfort and well-being, we must see whether the patient is or is not injured and write it down accordingly. We must write what we find—not write for the company or for the patient, but absolutely what we find, nothing less nor nothing more, then we shall be justified when we go into court.

Dr. Beattie (closing): If Dr. Milligan had listened carefully he would have found that my first injunction was, when you go into the patient's presence do not talk too much. Then I said that when we look at the patient much can often be learned by observation. That is the first thing—not to begin feeling the pulse. Many times when we step into the presence of a patient we know at once simply by looking at the face that there is a condition of terrible shock. In these cases, as the doctor said, we must get busy with our hands at once. We may very nearly know what to look for the moment we see the patient, we note the gasping respira-

tion, perhaps feel the pulse, and we begin looking for something else right away.

In regard to taking notes, we should do this as soon as possible after attending to the patient, not especially for the railroad company or for the patient, but so that if we as railway surgeons are called into court we know the exact condition that existed then, we have the record in writing and have it in our hand if necessary to refer to it. I did not mean that I first take a pencil and make notes, then work with the patient for a while. If possible I have a nurse with me, in which case she takes the notes for me, sometimes I have a stenographer present. But if I have neither of these, then I simply sit down and take the notes as soon as I get through with the patient, for I believe that we as railway surgeons should be very particular to have accurate and careful notes taken as soon as possible after we first see the patient.

FIRST AID TREATMENT.*

J. A. DAVIS, M. D., FARMER CITY, ILL.

First aid treatment, in case of a railway injury, depends entirely upon the severity of the injury, its extent, location, and the person injured.

It would be entirely impossible for one to mention all the different injuries which can possibly be received through accidents that occur, yet it will not be out of place at this time to mention some of those that a number of you have witnessed and given first aid treatment. I might say, first aid treatment consists of what to do and what not to do, what *not* to do may be the most important at least in some cases.

Personal care of the wound should be the first mission, which varies in accordance with conditions present with the wounded. It is well to give every wound your careful attention, for, no doubt, as some of you have experienced a trivial wound will sometimes prove fatal, while some of the desperate wounds give but little trouble. There is no doubt but that we often make grave mistakes when we dress a slight wound. Wounds should be perfectly cleansed, first of all important.

In case of severe injury attended with hemorrhage it is of the utmost importance to control it immediately, and as perfectly as possible, using such means as are indicated. It has been my experience that nearly all surgeons dress wounds with the bandage applied entirely with too much force. Thus we find our dressings should be carefully applied, neat and clean.

The cases presenting a hemorrhagic diathesis are exceedingly troublesome. In such cases Monsel's solution is possibly the best application. It has served me well. Adrenalin is of some use also.

When called to a place where several are injured, it is highly necessary to have a sufficient number of competent assistants. External injuries, such as cuts, bruises and dislocations, and simple fractures, require but little time for examination and dressing. Not so with internal injuries. These require close observation, especially when we find a high degree of shock, the result of an internal injury, attended with symptoms of hemorrhage. In well-selected cases it would be folly to wait for reaction to take place, as it would no doubt never occur.

It does not become the surgeon to take too much time, even in the important matter of differential diagnosis, but he should attend to the progressive conditions whose continuance will add much to the seriousness of the case. Remember a limited amount of hemorrhage from the mouth, nose and ears is beneficial in most cases in concussion of the brain and nearly always ceases in a short time. Cleanse the cavities, apply proper dressings, is about all that is necessary in the above mentioned cases.

We should not forget, in case of injury to the extremities, to apply the bandages high above the parts injured. For instance, a crushed finger, when needing dressing, requires the bandage to include the hand and forearm. No greater mistakes are made than improperly applied dressings. In fractured ribs, do not forget to encircle the whole chest with your bandage. Severe injuries of the feet should be dressed with the bandage carried above the knee.

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

No attempt at removal to a distant point should be made, unless there is no place close by which will permit of shelter and accommodations. All railways should be supplied with suitable cars for the removal of their wounded.

After giving first aid treatment to the wounded, the disposal of the patient is often a perplexing question. Some will consent to be removed to a hospital, others will make objections, and will insist on being removed to their homes. If an entire extremity has suffered, no transportation should be imposed upon the patient except to the nearest shelter, where warmth can be obtained and where he should be given every attention necessary, until the patient is recovered sufficiently to be removed. No doubt exists in the minds of thoughtful surgeons but that the jostling and exposure in transportation might be the direct cause of mortality in many cases. Consequently we say it will depend on the nature, extent and the conditions in which we find our patient, what way we would direct for their disposal.

No amputations or surgical operations should be performed until the proper time. Under no conditions should any amputations be performed until the patient be removed to a convenient place and has completely recovered from the shock. Temporary treatment, in cases requiring amputations, should be adopted until the patient is removed to a place where the line of permanent and radical treatment can be properly instituted.

Dislocations should be reduced immediately and receive a complete dressing. In most cases this requires but little time.

Fractures should receive early attention, and if a permanent dressing cannot be applied, a temporary one should be substituted. Fracture of the clavicle is often met with and should always be dressed as soon as possible. A light copper splint, lightly padded, strips of adhesive plaster, and a roller bandage well applied will be all that is needed. (I refer to fractures of the clavicle as they are of frequent occurrence and a source of great annoyance when improperly treated.)

Fractures of the skull do not call for speedy operation, except sometimes in compound fractures. Immediate operations for fracture of the skull are most always attended with mortality, and brings surgery into disrepute. Surely no well-informed surgeon would trephine the skull of a patient until reaction had thoroughly set in. At least the powers of life should have time to regain some of their lost force. If the pulse is scarcely discernible, attended with cold extremities, no surgical intervention should be undertaken, as the result will be almost always fatal.

Burns and scalds are of common occurrence, and are the source of a great amount of suffering and deformity. From what we have seen of these lesions I am satisfied that few practitioners understand their character, or treat them with the success of which they are capable. Perhaps the reason for this is that every physician has a remedy for them and scarcely any two agree as to the kind of treatment best adapted for their relief. Various remedies have been employed from time to time, some of which has been highly recommended by able physicians and received equal condemnation from others. The fl. ext. of hydrastis (U. S. P.) 30 per cent solution is the best application I have ever used. It has given the best results with those who have used it. All agree the exclusion of air is extremely necessary. Morphia should be administered early and given in full doses. Burns and scalds are among the most dangerous of accidents and call for urgent treatment.

Of all the different articles that have been applied to burns and scalds none are more dangerous than white lead and oil. Under no conditions should they be used.

Do not make improper use of the bandage. No surgeon who is capable of properly applying it can doubt its great utility. We should not allow ourselves to be betrayed into a species of hobbyism or mislead our judgment and bring surgery into discredit. The evil which may result from careless application of the bandage may be everlasting. Numerous instances have come under my observation where the loss of limbs, and even life, were the forfeit of its careless application.

Do not use heavy splints. The lighter splints should always be preferred. Fractures and dislocations should always receive a complete and

scientific dressing at the first aid given, but no *plaster* dressings should be used. In all my thirty-four years of practice not a single time has it been necessary, either in simple fractures or compound. Several times, however, I have seen evil effects from plaster casts that had been applied but a few hours. Nothing could be more out of place, especially in giving first aid treatment.

The question is often asked, "What do you consider the best antiseptic?" I would answer, sterile water, soap, normal salt solution and alcohol. Other antiseptics should be used with the greatest of caution. Do not use iodoform in a haphazard way. It does no good and often does harm, especially where we have a large amount of denuded surface. Poisonous effects have followed its free use in wounds. Complete prostration may follow its application and cause an error in diagnosis. I believe the verdict of most, if not all therapeutists, is that it keeps the field aseptic, but poisons the patient. Idiosyncrasy may exist with regard to iodoform. Possibly the best method of its application would be in the shape of iodoform gauze, first applying three or four layers of plain sterile gauze, followed by three or more layers of iodoform gauze.

The same may be said of bichlorid of mercury. Do not give your patient a hypodermic of ½ grain of morphin and leave him in another's care without giving notice of what you have done. This will also apply to strychnia. The nurse or doctor you leave in charge may repeat and do injury.

Be particular about your examinations and especially note whether or not a truss, support or any kind of a brace is worn. Also if the eyes are normal and any other marks of a previous injury can be detected. In case of fractures do not tell the patient that, in all probability, he will have a stiff joint or any defect after the union is complete.

The cases that give us the most trouble are those that are not injured but claim they are. Numerous cases have come under my observation of this kind. Some could be traced directly to the surgeon giving the first aid treatment theorizing on the subject of traumatic nerosis, and giving the patient a lecture on this subject. Do not tell the patients that railway injuries are of the worst type, for they are no worse than the injuries otherwise received.

Keep your records in a careful way until you have discharged the patient or placed him in a hospital that may be out of your reach. In the latter case a copy of your notes should always accompany the patient.

DISCUSSION.

Dr. G. F. Beasley, Lafayette, Ind.: I agree with the essayist in a great many things, and disagree in some others. In regard to checking hemorrhage by hemostatic agents, the nicest thing of that kind to use was gotten up by Dr. Parke—equal parts of tannin and antipyrin, and sufficient alcohol to dissolve it. That makes a nice, clean antiseptic, and you can check hemorrhage with it. Adrenalin will do the same thing.

In regard to the question as to whether amputation should be done until reaction from shock has taken place, I will give a case in illustration. Monday evening a man was brought to the hospital with both legs crushed and he had no pulse, as cold as a frog, breathing shallow. I gave him a hypodermic of morphin and adrenalin, which brought the pulse up a little, but he was restless and apparently suffering. I directed the interne to give him an anesthetic, when his pulse came up, and with double amputation he has gotten along all right. So if you wait in those cases until reaction comes, sometimes you wait a little too long. It has been my rule to operate just as quickly as I could. As to injuries about the head, if you wait too long the coroner or undertaker takes care of the case and you have nothing more to do. In cases of fractured skull it is my opinion that the sooner we operate the better—not wait for symptoms.

Dr. Hugo Philler, Waukesha, Wis.: In regard to burns, I think the essayist left out one important point, that is the continuous immersion in warm water, which is practiced yet to a great extent in Germany. Where I cannot do that, I adopt Bevan's method, which is to prepare small strips of rubber tissue about two or three fingers in width, and after proper sterilization to apply them over the denuded surface, like tiles on the roof of a house. Over this I

put a moist boric acid dressing. I can tell very quickly which part of the denuded surface is suppurating, and removing the strips on that place I sterilize and put on fresh strips of the rubber tissue. Elevation of temperature and other symptoms tells me if something is wrong. I put the part at rest. In this way I have successfully treated burns of the second and third degree.

Dr. G. W. Yeakley, Bowie, Texas: I understand that the purport of this paper is first aid dressings, that it does not refer to anything further than the immediate relief of the injured. It has been my misfortune, or perhaps fortune, to be mixed up in several wrecks; one in particular I wish to refer to, a Denver through train from Kansas City running 35 miles an hour. About 4 miles out of Bowie the chair car and sleeper struck a broken rail, turned over and rolled down an embankment. The accident occurred about 2 o'clock at night, and an urgent summons was sent in for all the doctors in town and all available help. My partner was surgeon for the Denver road. He called me immediately and we with three other local physicians responded. Some 30 or 40 men were there as passengers and those who were not injured had taken the injured out and laid them on the ground. It was dark, but we had some coal oil lamps to work by, and the surgeon of the road assigned to me the duty of going through and finding the hemorrhage cases. We had no water and nothing to work with except some sterile gauze and absorbent cotton and bandages sufficient to control hemorrhage. After the patients had been looked after temporarily we took them to town, and, having no hospital there the patients were sent to different places and doctors assigned to the cases, when we proceeded to put on permanent dressings and take care of them in the best way we could. My experience in wrecks has been that we have to use common sense and judgment; we cannot have any certain line mapped out before we get there because we have to handle every case in the condition and among the surroundings we find it. I have read about "First Aid Dressings," but I have never been in a wreck yet where I could carry out any specific line of work. The surgeon has to go on the ground, keep his head cool and his hands as clean as he can keep them and take care of the patients the best he can—first control hemorrhage, then relieve pain, after which he must get them some place where he can take proper care of them, making the surroundings as nearly aseptic as possible. So all I pretend to do in first aid is to take care of the hemorrhage first, the pain second, and then get them some place where they can be taken care of properly.

Dr. A. B. Bowen, Maquoketa, Iowa: Mr. Chairman, the essayist advocates fluid extract of hydrastis as a specific for burns, at the same time he severely condemns lead ointment. I have used lead ointment frequently with happy results and never had any bad results.

Dr. J. D. Milligan, Pittsburg, Pa.: First aid is, as I understand it, the subject of the paper, but the author appears to get into deeper water than first aid, and I do not know whether in discussing his paper I should begin with the first aid and stop there, or get after the deep water side of it.

First aid, as you all know, means the first thing that we do, and it is this which decides the fate of the patient so far as the wound is concerned, because if a dirty dressing is used, and there is opportunity for infection, the case is dirty from that time on; if you do not take the first step right, the outcome is doubtful.

I take exceptions to the deep water part of the paper, particularly in regard to fractures of the skull. I think it is the duty of every honest and conscientious surgeon, as Professor Gainear said years ago, to cut the arteries with impunity, but to take off our hats to the most insignificant injury to the head. Before you go any farther, be sure to cut down on the least point of suspicion and keep on cutting until you find whether there is a fracture of the skull or not. In addition, let me say this: That the insignificant scar on the head does not amount to anything, but the coroner will get the case if there is a neglected fracture there which involves the tissues to the extent of the dura being invaded by large clots, etc. I think it is imperative on the part of every surgeon to cut down immediately, regardless as to whether the patient is unconscious or not, and ascertain positively whether he has a fracture of the

skull. Last week a patient came into our hospital, but positively refused to have anything done. He was conscious, his temperature and pulse were all right, but he was irritable. He was put under my care. We could not, however, get any consent on his part to make the necessary incisions to ascertain whether there was a fracture. The next day he was sitting up in bed and insisted on going home. The next day he had a convulsion and died, and the post-mortem held by the coroner showed a linear fracture externally which could not be discovered by any external evidence, but such an enormous clot had developed from the fracture and the internal table of the skull being thrown down and cutting across one of the arteries here (indicating), that the man died. His life could have been saved by operation, but there is no man living who by visual examination would have said there was a fracture of the skull in that case.

I would like to ask why the author makes such a change from Monsel's solution to adrenalin? What do you use either of them for? Don't you know that control of hemorrhage is accomplished by picking up the vessels? Don't you know that a little pressure will control any hemorrhage except from the capillaries, and that by this means you press all the extraneous matter out of your wounds?

Dr. Davis (closing): Cases of hemorrhagic diathesis are those where I use Monsel's solution. Did you ever have a case in which, when you put your needle through, the blood would fly? Some surgeons have practiced all their lives and never found a case like that. I have. If a surgeon finds a case like that he will use something, or else let the patient bleed to death.

So far as the fluid extract of hydrastis is concerned, I spoke of that not as a specific, because I do not believe in it to that extent, but I do say that I have saved more skin grafting by its use than by any other remedy I ever applied. Yet I do not allow myself to get in any rut, but in one case particularly, that of an engineer on the Big Four, where the whole chest and entire face were involved, I applied this agent on gauze, and never had a scar. The cells that are almost dead seem to have life put into them, and surely, gentlemen, if we can coax a cell nearly dead back to life by whatever means, we have done good work.

So far as injury of the skull is concerned, I have more regrets and more trouble in my practice from this source than any other, especially when I call in a man who pretends to know all about surgery and he insists on trephining the skull at a time when the patient has not the least chance of life, and he dies every time. I have seen it more than once. Where it becomes necessary that a man should have both his feet cut off, it might be that before reaction sets in you could amputate with benefit, just right away, immediately. I have amputated fingers and hands when the patient was unconscious, but it was right away. So I say that with all these cases we want to be careful what we do. We must not get it into our minds that we can do a certain thing every time.

So far as Monsel's solution is concerned in cases of hemorrhagic diathesis, I would never think of using it in a case where, for instance, a piece of glass had gone into the skull, I would open up and get hold of the artery—we are not speaking of those things; we can take the hemostatic forceps and get hold of the artery in those cases. Like Dr. Milligan, I believe in getting to it if necessary. If a person has received an injury to the skull and shows the least sign of a blood clot forming, then, gentlemen, I repeat, the sooner the surgeon operates the better—I agree with that.

Dr. Beasley: In regard to the question of hemorrhagic diathesis, to what extent have you had such cases?

Dr. Davis: In the last eight years I have had five cases.

Dr. Milligan: And in proportion to that class of cases, how many have you had who did not have it?

Dr. Davis: Possibly 100.

Hernia cruralis prevascularis is a hernia which bulges below Poupart's ligament in front of the blood vessels. It has followed forcible manipulation for the reduction of a congenital dislocation of the hip, probably owing to a rent between the sheath of the vessels and Poupart's ligament.—*Walsham.*

RAILWAY DUST.*

F. H. BLACKMAN, M. D., GENEVA, ILL.
District Surgeon C. & N. W.

Dust may be defined as any substance finely divided. It is everywhere and is a hard thing to get away from. The potential assault of modern civilization on things material is increasing its volume every day. Dust is the bane of cities. It is the greatest single source of discomfort and danger to health encountered in railway travel.

Our forefathers made dust with their stage coaches, but it remained for the present-day fast-going American to raise the greatest dust with his rapid ways of getting there. He does not seem to think or care how much his more slow-going fellows may suffer from the dust raised by his rapid moving street cars, automobiles, fast freights or passenger trains. He does not even seem to care how much dust he himself breathes or eats, especially in railway travel so long as he gets there quickly. The ways and means for rapid travel have increased more rapidly than the ways and means of checking the dust raised.

Railroad dust is composed mainly of crushed coal, rock, steel, iron, soot and very finely divided organic matter, carrying with it very many pathologic germs. All travel, more or less, so every one is interested in the question of railway dust and what can be done for relief from its discomforts and dangers. No railway coach as at present built has cubic air space enough for its complement of passengers and its ventilation is excruciatingly imperfect. If you attempt to add to the ventilation by opening windows, you get, as a rule, additional dust, and if you do not open them you get bad air of another sort. If we could know what we inhale in a long railway journey we would be surprised that we survive without immediate sickness.

The first thing attracting our attention, as we ride as passengers, is the particles of coal and fine dust which come sifting in through the ventilators or around the windows, accompanied by coal gas and soot. This form of dust is so apparent that no one is likely to dispute its annoyance or that it may seriously irritate the nose, throat and eyes.

Dr. Jacobi declares it to be a dangerous nuisance and a direct menace to health and life. He also says the mortality from acute pulmonary diseases is on the increase and he believes the cause to be smoke contaminated air, which causes a disposition for acute diseases of the lungs and air passages.

This coal dust and soot, with its gases, is more or less accompanied by a finer dust, whose composition is unknown to the average passenger. Coal dust and soot may blacken our hands and faces; dirty up our clothes, be carried up our air passages, making them more susceptible to the entrance into the tissues of the finer more unseen, more dangerously infective dust, which latter is the greater menace to health.

My attention was directed to the terribly infective nature of the dust of the railroad many years ago, when I first attended persons injured by the cars. I observed that all open wounds which had come in contact with the road bed, wheels, or external parts of the train, were *dangerously infected wounds* despite the most painstaking efforts to cleanse them.

The reason that appealed to me then, and appeals to me now, which I believe to be the cause, is the indiscriminate scattering of human excreta on the road bed. This belief of mine has been strengthened as the years have gone by. The discovery of the part taken by germs in causing suppuration and various diseases has only tended to confirm me in my belief.

Since the inception of railroads the excreta of the human beings who travel has been dumped helter skelter on the road bed without thought or care. This has increased with the increase of population and travel. In the early day when the population was sparse and passenger trains few and far between, as well as slow-going, nothing was thought of it by the railway management. If they did think of it, to wonder how in all decency they could permit it; the expense and trouble of caring for and disposing of the excreta in a different, less dan-

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

gerous way immediately stopped their thinking. But today, with a population which is increasing and becoming denser all the time, with a passenger traffic that is crowding the capacity of the trunk lines, a very different condition exists.

It is not possible to obtain statistical proof of the amount of damage done either to passengers or employes or to animals being transported, or whose pastures lie along the railway right of way.

The excreta of this vast passenger traffic is ground into the finest dust by the rushing trains. Fecal matter thrown down from one of the forward coaches of a long passenger train in rapid motion is never seen; because before the last car passes it is finest dust. I leave it to the imagination as to what becomes of it.

An examination under the body of the average railway coach discloses, wheels, axle beams, pipes, brakes and air tanks all covered with a crust of dirt more or less thick. The waste pipes from the closets are usually about a foot from the steps leading up to the platform of the car. On the dining cars the chests for ice and food stuffs are on either side under the car in line with the waste pipes; these being covered with a crust of adherent dust. It seems to me it would be a hard matter for any one to conclude that this is a sanitary arrangement. Let it be remembered that the sunshine does not get under the coach in many places, even if the air does.

As far as my knowledge goes, no effort has been made to do away with these insanitary conditions. The out of sight, out of mind idea has, I believe, had its way long enough. The sanitarians who say the dropping of the excreta from moving railway trains does no harm, have had their methods followed long enough.

There is a hue and cry made against the railroads with every yearly appearance of statistics of those killed by accidents. I believe if we could know the number of men, women and children killed by railway dust we would be appalled. The prevailing notion has seemed to be that the digging over in repairs, with the spreading of fresh gravel or crushed stone on the road bed would prevent danger from the excreta. It must be borne in mind, however, that the excreta from a swiftly moving train is pulverized and scattered some on the under parts of the cars, some on the road bed and some heaven knows where. I believe neither this fine scattering and digging over, nor the sunlight, the washing rains, the freezing winter with its snows and storms, will do away with the evils of this indescribably filthy way of disposing of human offal from railway coaches.

Persons in all stages of consumption are carried on railway trains, and while the utmost care may be exercised regarding the disposal of the sputum, no care is taken of the other excreta.

Sunlight is said to kill the tubercle bacilli in from 7 to 140 days, but this gives them quite a time to get in their work. The pus microbe is not so easily killed, neither is the colon bacillus, which is said by at least one observer to be the progenitor of the tubercle bacilli.

Cattle are the most susceptible of animals to tuberculosis. They are sent for feeding and breeding purposes to various parts of the country by rail. The pastures of many of these animals lie along the railway, the dust of which may infect their food or it may get into the water they drink. Swine are probably next in susceptibility to tuberculosis, and these animals are exposed in a similar way.

Persons afflicted with many diseases travel. They go from place to place seeking health. The human alimentary canal in this country, where it has so much to do, is not a very healthy one. A recent writer gives a long list of diseases in which the number of bacilli was determined per gram of dried feces. The number varied greatly, from 21 billions in pernicious anemia to 550 millions in mitral insufficiency. In a healthy man of 50 there were 33 millions; in a healthy man of 20 there were 25 millions. Then there are the entozoa. What percentage of human beings who travel are harboring such boarders I am unable to say, but I believe their number is not very small.

How any sanitarian can say that the excreta can be strung along the highway of commerce from fast moving trains and do—comparatively speaking—no harm, passes my comprehension and I wish to record my feeble protest against such a dictum.

The report of American Public Health Association says one reason why its many recommendations, made to railroads, remain without effect, is the general ignorance of the public, who have not yet, but will some day, sooner or later, raise a cry of horror and indignation at the apathy of railway managements and their utter neglect of ordinary sanitary precautions. It seems to me that it would be better for the railroads to adopt and carry into effect those measures plainly necessary to make coaches and road bed ordinarily sanitary and safe, rather than to await the enactment of stringent laws compelling such measures.

The vestibuling of coaches was a good step in the right direction. It needs quite a few other things done to make the railway coach sanitary, so far as dust is concerned.

Closets, with receptacles for the excreta, arranged so they can be flushed out at the terminals, or, in lieu of these, dry earth closets which can be easily cleansed. Some plan by which more perfect combustion in the fire box of the locomotive is greatly needed; this, with larger ventilators, double screened, would keep out the most of the locomotive dust.

The railroad that will act on the above suggestions, and also oil its road bed, will earn the good will and praise of the traveling public and can truly announce itself as the "only sanitary way."

DISCUSSION.

Dr. E. M. Eckard, Peoria, Ill.: A year ago I read a paper before this Association regarding railway sanitation. Before writing that paper I had occasion to carry on some experiments in the health department of our city, and ordered the floors of all school-houses oiled, or at least part of them, in order to find out what effect, if any, dust might have upon the health of pupils. Before having this done, however, I took some of the dust which had accumulated at about the level of the seats and made examination of it to determine the number of germs in it. After the floors were oiled I found the number of germs had decreased, that whereas when there was no oil on the floor the number ran up into the millions and even billions, after it was oiled the number was down in the thousands. So I feel sure that the way to eliminate some of this dust is to oil the floors of cars, especially the smoking cars and those not covered with carpet or some sort of cover. This has been done on some of our cars with great benefit. You have all noticed that in the smoking cars there is nothing but matting, on which people expectorate, the sputum dries and is carried from one car to another. I asked the president why it was put there. "To spit on," was his reply. I asked him why rubber sheeting was not placed on the floor and then burned. Further, I believe that there should be some sort of regulation whereby all cars would be vestibuled. In the discussion of my paper last year, one of the gentlemen referred to the fact of certain improvements in sleeping cars. In place of plush curtains, something with a smooth surface, on which dust cannot accumulate, is in many instances now used.

The essayist's points are well taken, and many things could be done to improve the service, especially in the amount of dust. Some germs are dangerous to human beings. The wind comes in at the door and brings dust in, and this is swept about the cars. Another thing that would, I believe, have a tendency to improve the condition, would be to have the woodwork, as far as possible, rubbed down with an oiled cloth, instead of throwing the dust about with a duster as porters now do. There are a number of little things which, if the railroad companies would make up their minds to and the surgeons and sanitarians would take into hand, would render the dangers of infection not more than half as great as they are today, if not less.

Dr. J. D. Seba, Bland, Mo.: I have been health officer of Gasconade county for a number of years, and for that reason ought to be, to some extent at least, familiar with the question as to how excreta of the human body should be taken care of. In the first place we find that if it is buried in a soil that is not too much impregnated with former excreta, it simply eats itself away within a comparatively short time. Disinfection with lime is also to be recommended. As to the railroads scatter-

ing dust and disease along its path, I really believe that the subject is a little bit overdrawn. Dr. Frank Porterfield, Atlantic, Iowa, surgeon of the Rock Island system, last year, at Hot Springs, Ark., read a paper on this subject in which he stated that he had carried on an extensive correspondence for the purpose of finding out, as nearly as possible, in how many cases of consumption the disease had actually been contracted on railway cars, and he found no proof that any cases had been contracted in that way. We must take into consideration the fact that even the smoke of an engine, although dirty and dusty, is sterile the same as the soot of a stove. In cases of severe head injuries I have had to scrub soot out of the wound, still the infection was nil as far as the soot was concerned, simply because it had been subjected to a high heat and was, for that reason, sterile.

To come back to the subject of excreta being strewn along the line of railway, we probably do not know a better way of disposing of it at this time. To carry it to the terminals, say, for example, on a line from Kansas City to St. Louis, where they already have an enormous amount of sewage to dispose of, would be to make the conditions worse, whereas along the right of way, where the soil is mostly gravel, it is absorbed or washed away and dissolved by the first rain. So I believe that instead of it being a step forward to try to dispose of it in any other way, it would in reality be a step backward. We often study a condition and think we could, with our master minds, help it greatly, and still when we get at the practical solution of the problem we find that our plan would result in failure. I for one believe that sunlight and fresh air do enter our railway cars, and in abundance. It would be a hard matter to keep fresh air, and sunlight, when the sun shines, from entering a train that is moving along through the country at the rate of 30 or 40 miles an hour.

Dr. Blackman (closing): The gentleman who last spoke holds the view that has been expressed many times and that I have sought to combat for years. While that view might be by some considered the correct one in times past, before the country was so thickly settled, it certainly in my judgment is not true now. If you have stood by one of our fast moving passenger trains you know how they go and how they grind everything into powder. Only a short time since I was traveling, and I was sure I could detect fecal odor in the dust on the window-sill. You may say I have a good nose for this sort of thing, and I have even for an old fellow. There are twenty-five or twenty-six trunk lines entering this city from various directions. There are five trunk lines running through the county where I live. It is a great dairy country, supplying much of the milk for this great city, and there are many cows in the pastures along the lines of these roads. The first thing passengers do when they get up in the morning is to use the toilet, so the amount of excreta is far greater within a radius of 50 miles of Chicago than further out on the lines. It is a well known fact that the Bacillus subtilis is found in newmown hay, resembling closely the tubercle bacillus, and in some animals it will produce a disease which cannot be distinguished from tuberculosis

So it would take no great stretch of the imagination to believe the hay bacillus, a modified form of the tubercle bacillus, considering the number of tuberculous persons traveling on our trains, and the chance for so much meadow land to be infected by dust from the railway, which, after all is said, is nothing but a dirty open sewer.

NEW METHOD OF ASCERTAINING THE TEMPERATURE.

In cases where there is difficulty in taking the temperature of the body directly, Englander advises measuring the temperature of the urine. A funnel is lined with filter paper and the urine passed into it. When the bulb of the thermometer is plunged in the fluid, in a few seconds the temperature—which is the same as that per rectum—will be noted.—*Lyon Medical.*

The presence of *facets on gall stones* is of some importance to the surgeon because in the course of an operation it affords him valuable evidence concerning the existence of other calculi in the gall bladder or ducts.—*Bland-Sutton.*

TETANUS.*

G. W. THOMPSON, M. D., WINAMAC, IND.

Some of you perhaps think it strange that I took up the old subject which I have for discussion today, a condition that so seldom arises in the practice of railway surgeons under our present antiseptic precautions. I wish simply to refresh your memories in regard to this disease, and, again, in my researches I find that very little literature is furnished on the subject of tetanus from our journal correspondents. Most of the information to which we have access is found in the books, and I think that we are sometimes unmindful of those subjects that are old, yet it may be very essential. That is my reason for writing on "Tetanus" at this time.

In the entire catalog of surgical diseases we find few that are less amenable to treatment than the one produced by the Bacillus tetani, and known as tetanus. This disease has existed since the beginning of time, neither man nor beast having escaped its ravages. Thus far its successful treatment has baffled the skill of the best physicians in the world, in every age and in every clime. It is considered one of the most fatal diseases incident to the human family, the mortality being almost as large, if not larger, than the mortality in the diseases known as hydrophobia and trichinosis. Its horrors can be realized only by those who have seen cases of it, and have witnessed it in all of its intensity. For centuries and centuries past all that could be expected from treatment was to give the patient temporary relief by the use of soothing remedies, and thus modify the exaggerated symptoms, giving the patient a peaceful hour in which to die.

With all the recent advances in medical science and the discovery of the serum treatment, which gave the profession so much hope that a successful plan of treatment had at last been discovered, the number saved who have fallen victims to the disease does not exceed 20 per cent. Until recently its cause was a hidden mystery and its pathology not well understood. During the past decade, however, the microscope has brought out some very important truths, and its causes and pathology are better understood. It is a theory universally accepted among pathologists that it is caused from bacilli which find their way into the system through traumatic sources. It was the opinion of early writers that it might occur from both idiopathic and traumatic causes, though the consensus of opinion of the more recent authors is, that it seldom if ever results from idiopathic causes. It was Nicolaier who made the first discovery of the bacillus in the year 1885, and to him we are indebted for what enlightenment we have on the subject. His discovery has been generally accepted by the profession, all agreeing that it is an infectious disease of microbic origin and should a successful plan of treatment ever be discovered, it must be some kind of remedy which will destroy the toxins in the blood.

The bacilli enter the system, as we think, only through traumatic sources, though the traumatism may be so small as to escape notice, or perhaps be within the alimentary canal hidden from view. Upon their entrance into the system they first make their impressions on the spinal cord and medulla, from which a large number of the voluntary muscles are supplied, causing motor neurosis, characterized by tonic spasms, first the facial, then the spinal muscles becoming involved. The nerves supplying these muscles originate from the cord and medulla and are the first to respond to the effects of the toxins which find lodgment there. As the disease progresses the entire muscular system responds to the infection, when general tonic spasms of all the muscles take place with increased severity. It can not be regarded as essentially inflammatory in character from the fact that the spinal cord is often found after death without any evidence whatever of inflammatory action or vascularity of the cord or its membranes.

Punctured or lacerated wounds are more likely to cause an attack than clean-cut wounds. Wounds of this kind inflicted on the hands and feet are more likely to become infected with the germs of tetanus than wounds elsewhere on

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

the body. It is easy to understand why this is so, and why the disease is so likely to originate from such causes. As a rule punctured or lacerated wounds are more painful than clean-cut wounds; they do not bleed so freely, nor offer such favorable opportunity for successful drainage. Generally they are deeper, consequently the infection is introduced into the deeper tissues with but little chance for escape, and in many instances the wound is allowed to go for days before it is cleansed and made aseptic. It often happens that spasms occur before the wound begins to slough, though quite a large per cent of cases occur after the wound is apparently healed. The bacilli of tetanus are in appearance similar to the bacilli found in hydrophobia, and are very much like them in their effects upon the system.

Rosenbach describes the Bacillus tetani as an anerobic micro-organism presenting a bristly appearance, with a spore at one end, giving it the appearance of a drum stick. These bacilli will produce spores in thirty hours in cultures kept at a temperature of natural body heat, but are readily destroyed if placed in a sterilizer, heated to 212° F., if kept there for a period of five minutes. Different kinds of surface soil are productive of them. They are more often found in street dust, and in barn yards and stables, than elsewhere. Brieger has demonstrated that the toxins of the bacillus of tetanus cause the convulsions; he has also demonstrated that the disease can be transferred or produced artificially by injections of wound secretions of tetanic patients, or by using mixed or pure cultures. These proofs have established the fact that the disease is of microbic origin, and the essential cause is the bacillus first described by Nicolaier; that these germs multiply with great rapidity in earth, fertilizer, cess-pools, and in the secretions of wounds of tetanic patients.

The time of incubation in man is variable and quite uncertain. In some cases it may not require more than twenty hours, while in others it may require several days or even weeks from the time of the infection until the disease manifests itself. The uncertainty of the time of its development may be influenced largely by the number of bacilli in the wound. It is altogether likely that the location of the point of injury may have something to do as to the time of incubation. It has been proved that both the acute and chronic forms are caused by the same kind of microbes, and again that climatic conditions have much to do in the way of influencing the disease, the warmer climates being particularly favorable to it, though people living in extreme cold climates are not considered immune from the disease.

The symptoms are quite pronounced from the beginning of the attack. The first thing the patient complains of is stiffness of the jaws and muscles of the throat and neck; the tongue becomes stiff and in many cases deglutition is made impossible. At the same time a peculiar expression of the countenance is observed—an odd expression of the face resembling somewhat a painful smile, the cause of which is incipient spasm of the muscles of the face. As the case progresses the muscles of mastication and deglutition become rigid and fixed, making it impossible for the patient to open the mouth or speak distinctly. As the disease advances the stiffness passes down the spinal muscles to the legs, which are held in a firm spasm. When convulsions come on the patient suffers from intense pain and the greatest distress. As a rule there is increase of temperature, and especially as death approaches, ranging from 102 to as high as 108 or 110 F. The mind remains clear until death, unless extreme carbonic oxid poisoning takes place, which sometimes occurs on account of spasms of the muscles of the chest, impeding free respiration.

Since I have been engaged in the practice of medicine, 5 cases of tetanus have come under my professional care; this covers a period of thirty-six years. All these cases were from traumatic causes, and 4 of the 5 cases died, making a mortality of 80 per cent of the number treated.

Case 1. A married woman, age 22, received a gun shot wound of the right ankle joint, which resulted in gangrene. This case was treated by my neighbor physician, and did not come under my treatment until the tenth day from the time the injury was received. I amputated the leg at the upper third immediately, and dressed the stump with antiseptic dress-

ings. On the tenth day after the leg was amputated symptoms of tetanus developed. I prescribed bromid of potassium and hydrate of chloral in full doses every two hours, and 1/4 grain carbolic acid subcutaneously every 4 hours, and placed the patient in a dark room free from noise. When symptoms of heart failure appeared digitalin and nitroglycerin were given by the hypodermic method. She died on the third day from the time of the attack, with all the horrible symptoms of tetanus. This was a typical case of traumatic tetanus, caused from gun shot wound.

Case 2. A male, nationality Polander, age 42. This was a case of gun shot wound of the right foot, a full charge of bird shot having penetrated the instep, causing an ugly lacerated wound. Unfortunately the case went for six days without surgical attention. On my first visit I found a well marked case of teanus, the patient being unable to open his mouth, the head being drawn far back on the shoulders. On examination I found a putrid wound and most of the gun wadding and several shot were removed with a large amount of shattered bone and decomposed flesh. The cuboid bones and astragalus were practically all destroyed. The wound was cleansed with the usual antiseptics and the patient placed on the same kind of treatment that was prescribed in Case 1. On the second day from the time of my first visit he died, with all the agonies incident to the disease, that being the eighth day from the time the injury was received. Amputation of the foot was thought to be impracticable because of the severe symptoms of tetanus having developed in the case before it had received any treatment.

Case 3. A female, age 10; she sustained an injury to the right hand, the middle and index fingers being lacerated by a rope and pulley while assisting her father in stowing away hay. The palmar surface of the fingers was lacerated and torn from the bones. On the eleventh day after the injury was received symptoms of tetanus developed; the wound had received no attention previous to that time by a surgeon. On my first visit I curetted and cleansed the wound with antiseptics and placed the patient on the same plan of treatment that was prescribed in the above cases. She made a perfect recovery at the expiration of six weeks.

Case 4. A lad, age 8, who received an injury to the left hand, middle and index fingers being caught in the cog-wheels of a cider press. The wound was dressed, soon after the injury was received, with antiseptics. On the sixth day he was seized with an attack of tetanus; the same kind of treatment was prescribed as in the former cases. He died on the tenth day from the time of the injury.

Case 5. Female, aged 12, who sustained a lacerated wound of the middle finger, it being injured in the cog-wheels of a fanning mill. She developed tetanus on the eighth day from the time of the injury; she received no medical treatment until tetanus appeared. On my first visit, which was two days after the first symptoms had developed, I curetted and cleansed the wound and dressed it with the usual antiseptic dressings. I prescribed the same kind of treatment that was made use of in the former cases, with the addition of antitoxin. I used five injections, or one injection every four hours, of 2,000 units each, all the injections being given within a period of thirty hours. She died the second day after the treatment was commenced. The effects of the serum did not seem to modify the symptoms in the least, and the patient died with all the horrible symptoms of the former cases.

The prognosis is always considered grave in such cases, and thus far little could be expected from any kind of treatment in the way of curing the disease.

If anything good has been realized from the use of the antotoxin it has been from its prophylactic and not from its curative effects. As a prophylactic, its use should always be encouraged.

In presenting this subject I have not attempted to introduce anything new, nothing which has not often been referred to by others who have written on the subject. The one thing most interesting in the study of any disease is, if possible, to arrive at a correct knowledge of its true cause and origin. The next to consider after having found out the cause, is the successful treatment, and paramount to both is its prevention. In my limited

experience in the treatment of this disease it could hardly be expected of me to introduce anything new on the subject, for your enlightenment. I hope, however, that what has been said may be helpful in the way of refreshing your memories in regard to this fatal malady.

DISCUSSION.

Dr. J. H. W. Meyer, La Porte, Ind.: I had the misfortune to have a case of tetanus within the last two months, which differed in some respects from the cases which have been reported in the paper just read. The wound was produced by a nail and was located just beneath the big toe of the right foot. I first saw the case eight days after the injury. The woman came to my office with well marked symptoms of lockjaw. Otherwise she was in good health. I prescribed potassium bromid in large doses and sent her home. The next day I called and found she had very marked symptoms of tetanus. The big toe was drawn up and the muscles of the neck were stiff. I gave her 4,000 units of antitoxin and saw no effect from it, I gave her 4,000 more the next day and it did not seem to change the picture of the case at all. I continued the potassium bromid in large doses, I think 40 grains every two hours. On the night following this she rested reasonably well, but there was no relaxation of the spasmodic action. Nourishment was difficult of administration, but it was systematically given as well as it could be by rectal feeding, practically without change, for three weeks, when slight relaxation began to take place in the muscles of the jaw.

After the first week, there not being any special improvement to be noted from the administration of the potassium bromid, and seeing the action of the drug on the heart, I discontinued it, and the antitetanic treatment was kept up. The case continued, practically without change, for three weeks, when slight relaxation began to take place in the muscles of the jaw, but there developed a very quick heart action and then a feeble one. This cannot be attributed to the potassium bromid, as I had discontinued its administration so long before the weak heart action developed. This, however, was temporarily counteracted by tonics, but in a day or two there developed markedly quick respiratory action, this continuing for a couple of days, the heart's action becoming comparatively normal—100 instead of 140. At that time I did not expect her death, believing that, having survived three weeks, she would recover, but one of the horrible symptoms that has been mentioned came on. She died very quietly, the heart's action seeming to be the cause of death, as it became very rapid and feeble in spite of the fact that we had sustained the patient with nourishment from the beginning and given reasonable tonic treatment all the time, and had in no way neglected to do anything that would keep the heart's action in normal strength. The antitoxin did not seem to do any good.

Dr. M. Cavana, Sylvan Beach, N. Y.: Dr. Thompson's paper is especially interesting to me, particularly as regards the case he reports of tetanus following a gun-shot wound. In my personal experience I have known of three cases of tetanus resulting from gun-shot wounds, the gun fired at such close range that the wad of the cartridge lodged in the wound. Those of you who are familiar with these things recall the fact that the wad of an ordinary gun cartridge is made of animal hair of some kind, and I believe that infection in these cases resulted from this.

In Long Island in the vicinity of New York there is a portion of country devoted to gardening, where at one time almost every injury resulted in tetanus. The theory arrived at was that the common use of horse manure taken from the cities of New York and Brooklyn and used on the soil, had much to do with impregnating the soil with tetanic germs; in other words, that horse excreta is rich in the bacilli of tetanus, and the wad being made of horsehair was one of the means of infecting gunshot wounds.

Dr. I. K. Gardner, New Hampton, Iowa: Speaking of horse excreta being one of the etiologic factors in the production of tetanus, brings up the well-known fact that cavalrymen are prone to have tetanus following slight lacerations or abrasions of the skin. In France, experiments are now being made with reference to the value of antitetanic serum. They have taken a certain battalion of cavalrymen,

and in every case of abrasion or slightest laceration or scratch a man sustains he is treated with antitetanic serum, while in another battalion those sustaining these injuries are treated in the ordinary way. Cases of tetanus among those treated in the ordinary way were quite numerous, whereas in those treated with antitetanic serum before tetanus supervened no case of tetanus has developed. This brings us to the point that if we expect any good to result from the administration of antitetanic serum, we must use it as soon as possible after receipt of the wound, not wait till tetanus supervenes. In that way we get some good from the use of the serum.

Dr. E. M. Eckard, Peoria, Ill.: I believe it is the consensus of opinion that antitetanic serum is valuable, and my experience has recently been in line with that of the gentleman who last spoke. I had one patient who was kicked by a horse, and he died. About two months ago a patient stepped on a horse-shoe with a nail in it, and he died in eight days. In both cases antitetanic serum was used without any results whatever. I think it is always well to give cases of this kind the antitetanic treatment, especially where we are in doubt as to the cause of the symptoms.

Dr. E. F. Woods, Janesville, Wis.: In wounds of this character and, in fact, all kinds of wounds, I use 10 grains of menthol to the pint of turpentine to wash them out, and where I have done that I have had good results. This seems to be an antidote for the disease, as it destroys the Tetanus baccilli.

Dr. J. D. Milligan, Pittsburg, Pa.: This topic is too interesting to let it drop, because it stands between life and death, and, if you will pardon me, I want to recite something corroborative of the Doctor's paper. He states that he has had 5 cases of tetanus in his practice of thirty-six years. I have had 5 cases in thirty-two years, and have seen two in consultation with my brethren.

One patient in particular, a railway case, came under my observation. He had his back broken by an engine and his whole scalp torn off. He laid in a tunnel for some time before he was discovered, and died of tetanus in eight days. In 1887 a blacksmith, while paring the hoof of a horse which had recently been taken from the stable, cut the middle finger, but paid no attention to it. On the fifth day I was called and found his jaws locked and all symptoms of tetanus. I immediately amputated the finger above the joint and gave him large doses of morphia with 1-5 grain of atropia, keeping him stupefied for twenty-four to thirty-six hours, and he recovered.

The next case I refer to occurred on the 4th of July, 1890. My neighbor's boy was visiting friends in another town, and while there a gun he was handling exploded and the wad, which was of horse-hair, lodged in the palm of the hand. He did not speak of the injury to his people, but concluded he would go home, and, being 14 years of age, he was allowed to go. I was called on the fifth day and found that he had had convulsions. I sent him to the hospital, and on the way, in care of a nurse, he had nine convulsions. I placed him under antitetanic treatment, filled the wound with carbolic acid and also soaked his hand in clear alcohol, then gave him decided doses of morphin and kept him quiet. He had one convulsion afterwards and recovered. I do not know whether or not it was a case of tetanus, because no bacteriologic test was made.

It is too important a matter not to recollect this one thing: That a true history will point towards some equine source.

Dr. G. W. Griffiths, Louisville, Ky.: I want to say that I take an entirely different view from the gentlemen in regard to the treatment of punctured wounds. I never use a knife or curette. It has been found that many cases reported tetanus are not tetanus at all.

While in my reports to the company regarding cases of wounds of this character I have called attention to the very great danger of tetanus, in wounds of the hand I simply use hot water. In cases of this kind that I have had, I have treated with heat all the time, keeping the wound open. Instead of irritating the peripheral nerves, which have already been irritated, I avoid that, I do not do any further damage; I put the hand in hot water and keep it there night and day. A coal oil stove answers the purpose. I have treated compound fracture of the elbow that way with good re-

sults. In punctures of the ball of the foot the danger of tetanus is always present. In case of a gun-shot wound there if the patient does not get tetanus it is merely good luck. I never curetted a case of cut in my life, and I have never had a case of tetanus. In the railway shops 2,000 men are employed, and I have to treat puncture wounds produced by old ties. There is great danger in a wound made in this way, but to curette it would simply cause additional irritation.

So I wish to go on record as saying that in forty-two years' practice I have never curetted a punctured wound, never scarifying the case in any way, on the ground that irritation is already present, and why add more? I put the injured member into hot water; this opens up the wound—raises the skin above the injured part. I do not use carbolic acid or anything of that kind, on the same ground that I avoid curetting.

Dr. Thompson (closing): I have only a little to say in reply to the gentlemen who have taken part in the discussion. I wish, however, to reply to Dr. Griffiths in regard to curetting the wound. As I understand it, in cases of tetanus the bacilli enter the wound and lodge there, and the toxins given off by the bacilli migrate into the system, but the bacilli remain stationary in the wound. If that theory is correct, and I believe it is, I would still adhere to the plan of removing the cause of tetanus. If we should be successful in removing the cause by curetting and get all the germs out of the wound, following with the administration of antitoxin, tetanus will not develop. I believe the best authorities will substantiate this. It matters not what we do in these cases, gentlemen, a certain per cent of them will be fatal. No matter what kind of treatment you adopt in your cases you will find that about 80 per cent of those cases will be fatal. You can look up the statistics as far back as we can find authorities and I think that, unless it is that antitoxin is prophylactic, we have made but little advance in the curative treatment of tetanus.

As far as the hot water treatment is concerned, that is soothing and is good at the time for that purpose. In other cases it might remove some of the toxins or bacilli, but I can see no reason other than those for using it.

ENUCLEATION OF THE EYEBALL.*

J. D. SEBA, M. D., BLAND, MO.

It is not my intention to enumerate all the indications for the removal of an eye. There is a difference of opinion on the subject, some going even so far as to advocate the removal of all blind and unsightly eyes to make room for artificial eyes. Personally, I cannot indorse such a radical course, and believe that enucleation should be limited to eyes which are diseased to such an extent to either endanger the life of the patient or the sight of the other eye. If the eye that is to be enucleated has no gross anatomic lesion readily discernible, it is best that the condemned member be marked with an indelible pencil, to prevent a possible error in removing the good eye instead of the condemned one. Such mistakes have occurred in the past, but are inexcusable. The fact that this has occurred should guard every practitioner against such an error.

The operation generally performed for the removal of an eye is very simple: A general anesthetic is necessary. After scrubbing the field of operation, or rather the face of the patient, the eye speculum is applied to hold the lids apart. The ocular conjunctiva is divided along its corneo-scleral margin, with a pair of curved scissors and down to the point of insertions of the recti muscles. These are caught with a strabismus hook and cut. The ball is then, with the aid of a fixation forceps, rolled over to one of the canthi, and the optic nerve, artery and vein are all clipped off with one cut of the scissors. While the optic nerve is cut the patient should be completely under the influence of the anesthetic to prevent shock.

In cases of glaucoma and cancer, a few practitioners have used the actual cautery for a double purpose; first, to stop hemorrhage; second, to destroy as much of the diseased tissue as possible. Those methods are, however,

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

not much employed at present. The hemorrhage, as a rule, can be easily controlled by packing the cavity with sterile gauze; as for the curative effect of the actual cautery for glioma or cancer, I believe its effects are nil. Tissue that cannot be reached with the scissors or the knife cannot be reached by the cautery.

A purse-string suture of black silk should be inserted along the margin of the cut conjunctiva, beginning at the nasal side of the circular conjunctival wound and run along its edge until back to the place of insertion, where it should be tied moderately taut, leaving an opening from 1/8 to 1/4 of an inch. This aperture should be packed with sterile gauze. Where this procedure is followed, the actual cautery is seldom required, as it is usually sufficient to stop all hemorrhage. The whole ocular cavity may be packed with gauze and then a piece of it placed over the lids, and the same secured with a roller bandage. This bandage should be replaced once in twenty-four hours, and the suture removed on the fifth day. After this the bandage may be safely left off, but the ocular cavity should be cleansed several times a day with a saturated solution of boric acid.

While the above method is most generally employed, and is best suited for young patients, and where it is desired to wear an artificial eye, yet this method should not be employed in patients over 50, or in cases where malignancy is suspected. It is much better, after removing the eyeball as described above, not to leave the ocular cavity open, but to hermetically seal it. This is done by cutting away the eyelids and then sewing the raw surfaces together. The upper lid should be removed from the inner canthus, cutting outward a little above the tarsal cartilage. The outer canthus should be removed and the lower lid to a point below the roots of the eyelashes, but the puncta lacrimalia and the lacrimal canal should be avoided, in order to drain the cavity of tears. The edges are sutured from the outer to the inner or nasal side, where an opening is left sufficiently large to pack the ocular cavity with gauze, this may be removed in twenty-four hours, and the sutures on the fifth day, when, if the operation has been performed under antiseptic precaution, the wound has closed sufficiently for the sutures to be removed.

In saying a good word for this method, I will say that the surgeon's first duty is toward the cure of his patient from the disease which made it necessary to remove the eye. The personal appearance of the patient should be a secondary condition, for what good does it do a man to have a glass eye and be dead? Rather have no eye at all and be alive, for we will all be dead a long time; therefore, let us not rush through life even with glass eyes. We should remember that an artificial eye is an expensive ornament, and that in the aged it very often causes considerable irritation, and that such irritation in the aged is very often the cause of cancer, implanting itself in the tissues. Hence I do not advise the use of artificial eyes in patients over 50, and where they have not been accustomed to it before that age. The aged do not accustom themselves to new conditions as do the young.

Some surgeons are also in the habit of removing a sound blind eye for no other purpose than to make room for an artificial eye. In my opinion this is hardly justifiable. When a blind eye becomes troublesome, or endangers the sound eye, then it ought to be removed, but not for simple cosmetic effect.

DISCUSSION.

Dr. J. H. W. Meyer, LaPorte, Ind.: I do not feel like saying very much except in praise of the paper, with the exception that I do not see why we should advocate a general anesthetic for enucleation of the eye. This operation is, I believe, more often done without a general anesthetic than with one. I fail also to see why a person over 50 should be in such great danger of getting cancer from wearing an artificial eye. It seems to me that a person over a certain age should not be condemned to go without an artificial eye if he has lost the natural eye, any more than that an individual who has lost a leg should be condemned to go with a stump the rest of his life because he has passed a certain age.

Dr. Seba (closing)—In regard to enucleating an eye under a local anesthetic, it is not generally practiced. I do not know that it has ever been done. The optic is a large nerve, and it

take complete general anesthesia to sever it. If the patient is not completely under the anesthetic the shock to the nervous system is very great and endangers the life of the patient.

In regard to wearing artificial eyes, they are very expensive luxuries, for which people over 50 care but little, and if it is explained to them before operation they generally prefer to have the aperture hermetically sealed rather than to bother with artificial eyes. We should remember that eyes should only be removed

when they endanger the life of the patient or the sight of the other eye. That we remove them on account of the irritation they produce, and why should we place a foreign body in an orbit where the natural member had to be removed on account of the irritation it produced? It should also be remembered that people over 50 do not accustom themselves to wearing of artificial eyes as readily as younger ones.

I herewith submit a picture of a lady of 66 who had an eye enucleated after the method advocated in my paper. I ask permission to have it published with my article in the RAILWAY SURGICAL JOURNAL so the reader may better judge the advantage or disadvantage of this method.

AMPUTATION AT THE KNEE JOINT.

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Surgeon Big Four, Monon and Vandalia Railroads; for Indianapolis and Crawfordsville Traction Co. and for I. C. and W. Traction Co.

(In the reading of this paper you will see that what I mean by amputations at the knee joint is an amputation *through* the knee joint, not immediately above or immediately below.)

In making amputations of the lower extremity opportunities are sometimes afforded the surgeon to make the operation through the knee joint. It is not often done, but rather the point selected is above the knee. The idea seems to prevail that as good a stump cannot be obtained by a knee joint operation as one made at a point above the knee. The fitting of prosthetic apparatus no doubt has much to do with this opinion, as the adaptation of an artificial limb to a badly constructed stump is sometimes insurmountable, and unless the stump is entirely satisfactory the patient and the artificial limbmaker are apt to cast invidious reflections on the judgment of the operator. Then, too, the operation above the knee is much more simple, requiring less time, which is sometimes an important factor when the patient's vital forces are low.

But we should not ignore the axiom in amputations to always preserve as much of the member as possible, and the thigh especially, for the very obvious reason that it will afford steadiness on an artificial limb and facilitate locomotion. It is for this reason as well as other advantages that I have adopted this operation, the technic of which I will briefly describe.

My experience is limited to six cases, but the results have been satisfactory in every case in which I have employed it, and I can see no reason why it should ever be otherwise.

Two of the cases were amputations on account of disease and the other four were from crushed injuries received on railroads. Two of the railway cases were double amputations of the lower extremities. Three were operated in

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

hospital with every attendant convenience and aseptic surroundings; and three in private houses—two of these being emergency cases, operated while under shock from railway injury; and the other was made before the discoveries of Koch and Lister had brought the possibilities of surgery to its present high plane. The technic in each case was the same, except in two, where I had to borrow flap material on account of the part I use for the anterior flap being torn away when the legs were crushed in railway accidents.

The operation which I prefer is that of Gritti of Milan, except that part of it relating to the fixation of the patella. His suggestion was to fix the patella in position by the use of pins or sutures—just how no description is given in our surgical text books—that proceeding being left, seemingly, to the ingenuity of the surgeon attempting the operation. But his operation never became a classical proceeding in amputations at the knee, and did not attain the position in surgery it really deserved. The retention of the patella was a difficult proposition to all surgeons, as it could not be made immovable in the position required for a perfect result. The contraction of the quadriceps muscle would drag it out of place. As Sir Joseph Lister said, "It will tilt out of position and is so much in the way it is better to remove it."

In the May (1906) number of the *Annals of Surgery* Dr. Eugene R. Corson of Savannah, Ga., has an article, in which he reports a case of amputation at the knee joint, made by himself, according to what he terms the Gritti-Stokes method, that is, he made a supracondyloid amputation of the femur and brought down the sawed under surface of the patella against it without using anything but flap pressure to hold it. The result was a good stump—sound, symmetrical and firm. He supposed there was bony union, but on placing the stump under the x-ray he found the patella tilted to one side and upward like a half-open box lid and no bony union. Yet he was so pleased with the stump he was inclined to argue in favor of the amputation, even if bony union could not be had.

With the patella firmly held in position against the end of the femur, the operation has been to me most satisfactory. I will give the technic in detail:

I apply the Esmarch tourniquet at the junction of the middle and lower thirds of the thigh, then with a large scalpel make an incision for the anterior flap. Beginning at a point near the middle of the condyles on the side opposite the operator, cut to the bone on a line parallel with the axis of the femur across the articulation of the tibia, then in a circular line across the front of the leg a little below the tubercle of the tibia to a point on the proximal condyle corresponding with the place of beginning. The flap is then dissected up, keeping close to the bony structure. When the patellar tendon is reached it is cut from the patella at its lower border, leaving it undisturbed in its attachments to the flap, the dissection is continued, uncovering the condyles. The lateral ligaments and tendons are then divided, at right angles with the femur, to the posterior borders of the condyles, the knee flexed and the crural ligaments cut. The amputation is then completed with an amputating knife by cutting through the popliteal region, turning the knife in a curve so as to form a posterior flap about one-half the length of the anterior one.

The next proceeding is to saw off the articular portion of the condyles of the femur; this is done at a right angle to its axis and far enough up to include the intercondyloid notch, leaving a sufficient area of cancellated structure for uniting with the patella. The patella is then held securely with lion-jawed forceps and its articulating surface sawed off. The surface exposed is then sponged off with hot normal salt water, the popliteal artery ligated with chromicized gut, and the Esmarch tourniquet removed. The reason I have the tourniquet removed at this stage of the operation is that the circulation of the blood below the constricted portion of the stump may be restored with the least possible delay. Any bleeding vessels are easily taken care of by ligation or torsion and all hemorrhage controlled.

I then search for the stumps of nerves and draw them down with forceps and clip them off, so they may retract and not be included in the cicatrix formed in the healing process of

the stump, thus preventing subsequent pain and tenderness. The anterior flap is then reflected upward and the bursa of the quadriceps dissected out to prevent the possibility of bursal inflammation at that point during the use of an artificial limb. Carefully irrigating the raw surfaces, all bone dust and clots are washed away, and the most important step in the operation is begun—the fixation of the patella.

The anterior flap is brought down and the patella tried in its place on the end of the femur. If the retraction of the quadriceps prevents the patella remaining without being tilted, the flap is again reflected and the tendon lengthened by Poncet's accordion method. The patella may then be fitted to its place without hindrance; but before doing so the projecting edges of the condyles of the femur must be removed with bone forceps so as to reduce the bony structure to a rounded form. A small longitudinal incision is then made through the skin and underlying structures, to the bone, at the middle of the patella, which is again carefully fitted to its place and a sterilized steel wire nail is driven through this incision and through the patella into the cancellated structure of the femur, thus fixing it firmly in place. In no instance has this proceeding been a source of trouble. The nail has never required removal.

The patella unites firmly in bony union with the end of the femur and the result is an extraordinarily good stump. It never gets sore, tender or painful, never becomes conical by protrusion of bone, as there can be no retraction of the muscles of the thigh; and artificial limbs are worn with comfort—something not often happening where the amputation is made farther up in the thigh.

To illustrate the amputation I have some skiagraphs that I will pass around, by which you will see that the nail is in position and that the patella has bony union on the end of the femur.

DISCUSSION.

Dr. J. D. Milligan, Pittsburg, Pa.: Did I understand you to say that you saw the under surface of the patella or not?

Dr. Ensminger: With the amputation saw, I saw the patella down to a flat surface, cutting off all the articular surfaces.

Dr. S. R. Miller, Knoxville, Tenn.: The essayist has given us a description of some very perfect surgery, but it seems to me that it is primary surgery. I have tried the plan which he has described here with the exception of the nail. I have tried suturing the patella in place, and I have tried the plan of removing the

Radiograph of Stump, Showing Nail in Situ.

entire patella. So far as my experience is concerned, I have adopted the latter plan, and I have never had any occasion to regret it.

One case in particular was that of an engineer who has visited all of the eastern artificial limb supply houses, and he informed me the artificial limb men told him he had a perfect stump, and one in particular said he believed it was as good a stump for an artificial limb as he had ever seen. That man has an artificial limb, and though 60, has been running regularly on a passenger engine for three or four years and has never had a particle of trouble.

What is the doctor going to do if he gets infection there? He will have to take out the nail and remove the patella. And what good does the patella do in case it is saved, with the articular surfaces destroyed? The removal of the patella is just as good an operation as his and not half as dangerous. As we all know, many of these cases demand quick work and a minimum amount of shock, and you can certainly accomplish these ends by removal of the patella. The patella does not do any good as far as muscular action of the limb is concerned, because if you will remove the patella closely, leaving your tendon there, that tendon adheres to the structures around it and you have just as much use of the muscles of the thigh as though you had left the patella.

Dr. F. H. Blackman, Geneva, Ill.: The first time I had occasion to amputate the leg at the knee joint, there was so little tissue left that I had to do a cut-and-tie job. I succeeded in fixing the tissues remaining, in this way: I left the patella and anterior tissues intact, as they were not injured. I carried the patella, the tendon of which I took from the surface and spine of the tibia, well down in front of the condyles and as far posteriorly as I could, stitching the posterior flexor tendons to the patellar tendon. I did not remove any portion of the condyles nor fix the patella in place by any mechanical means.

About four years after this operation the young man called at my house for the purpose of thanking me for the operation and its good results, as we had discussed with him whether to do it as described or amputate above the knee. He told my wife, who assisted in the operation, giving the anesthetic, etc., that he was wearing an artificial limb very successfully and was having no trouble. He said the stump had been much praised by artificial limb men who had seen it, and he had called to show it to me and to thank me for not amputating above the knee.

Dr. Hugo Philler, Waukesha, Wis.: The question that arises in my mind is, that it does not matter so much how beautiful an operation is, but is it practical? To judge of this fact from the amputation of the feet; if the man is wealthy and one who can have all assistance, I would perform the Pirogoff amputation; if, however, he is a poor man and has to make his living thereafter, I would operate above the ankle joint. I believe half an inch or an inch below or above the patella is a far better, safer and quicker and more practical operation than in the joint. It may be all right to nail the patella to the femur after having prepared a suitable bed in the bone for it, but it is hardly wise for the sake of cosmetic expediency to open up innumerable bone canals, thereby further disturbing the already much disturbed circulation in the stump.

The gentlemen who were present last evening at the post-operative clinic given by Dr. Murphy will remember that in several cases he removed the patella entirely. (I do not know what good the bony structure of the patella is without the articular surfaces.) Dr. Murphy removes the patella, then takes the quadriceps and unites it by lengthening it with the ligamentum patellæ through the aponeurosis. I think that is better than to try to tie the patella to the amputated stump.

Dr. J. A. Davis, Farmer City, Ill.: As regards amputation at the knee joint and the use of the nail, my experience has been that in all amputations, the less we use artificial means, such as silver wire, nails, or anything of that kind, the better. My opinion is that the application of a nail through the patella and into the femur, will cause, perhaps not in five years, but at the expiration of six or seven or more years, more trouble to the patient than would amputation above the knee. I do not amputate through the joint, I do not think it is a good thing. Amputate above the knee at the lower third, and use no nail, which I believe to be bad practice.

Dr. G. F. Beasley, Lafayette, Ind.: The last speaker says to use as few artificial things as possible. That is all right, but if you cannot keep it in place any other way, why not use a wire to keep it in place? Dr. Miller asks what we will do in case we get infection. I have thought about infection in this connection, but I suppose a person ought to have clean hands and a pure heart. If the hands and nail are clean it will be all right. A man can walk a good deal better on the patella thus fixed than on the end of the femur, and the stump is that much longer and you have your muscle

attachment. Those cases always turn out well, and that is what we want. It does not take much longer to do this amputation than the other. If the nail gets loose you can open it and take it out.

Dr. Ensminger (closing): I have not a great deal to say because I have already said it. The only thing I can do is to recommend the operation to you, and I want you to test it if you have an opportunity and see for yourselves if I am not right. It has not been five years nor ten years since I began to use this operation, but thirty-five years. Of all the amputations I have ever seen, it is the most satisfactory. It leaves the end of the stump perfectly sound, without the least bit of tenderness. So far as infection is concerned, Dr. Beasley said that if we had clean hands and a pure heart, aseptic instruments and dressings, we would not have infection, and I assure you I have never had it. So far as the nail being a source of irritation is concerned, it never has been in my cases, and I do not believe it ever will be. Foreign bodies of a metallic character are carried in the body for years without the least bit of irritation or danger, and how a surgeon can say that this is liable to be a source of irritation and danger, is beyond my comprehension.

Dr. Milligan: What kind of a nail do you use, how large is it, and how do you prepare it?

Dr. Ensminger: I take an ordinary steel 6-penny nail and see that it is polished thoroughly, I am careful to see the point is well constructed so that there are no ragged edges to tear or crack the bone. The nail is sterilized carefully, first in hot water, then it is thrown into alcohol, and it does not leave the alcohol until it is driven into the opening that is made through the patella. I have never yet had one drop of pus form around that nail. I wish I could show you some of the cases I have operated on. I think it is a mistake to bring skiagraphs instead of the patients themselves, because could you have seen the stumps I believe you would have been converted to my doctrine about amputating through the knee joint instead of above the knee joint and cutting off the muscles that help to move the thigh. As to dividing the quadriceps muscle above the patella, you weaken the force of the thigh, you weaken the man's ability to walk well. Those things are easily preserved in this operation.

POINTS IN THE TREATMENT OF COMPOUND FRACTURE OF THE BONES OF THE LEG.*

P. M. BURKE, M. D., LA SALLE, ILL.
Local Surgeon, C., R., I. & P. Ry. Co.

Compound or open fracture of the leg is a very important subject because compound fractures occur more frequently here than in any other part of the body.

In a general sense it may be said that one who handles a fracture must work with great care, deliberation and certainty, leaving nothing to chance. The best and most modern methods of examination should be used, including if necessary x-ray, skiagraphs, etc. It should be remembered that if after putting up a fracture there is much pain or marked discomfort something is wrong. Compound fractures of the leg may be divided into three groups:

I.—Those in which the external opening is not very large, where there is not a great destruction of tissue, there may be much or little swelling, quite a little bleeding, especially on moving the limb which is the case with all compound fractures of the leg. There may be some comminution, some small fragments being detached from the large ones. In this group the external wound is nearly always caused during the application of the violence by the end of a bone fragment being suddenly pushed through the soft tissues and in the recoil the bone goes back again. Sometimes but rarely the point of one fragment remains external. This group constitutes about 80 to 90 per cent of all the compound fractures of the leg.

II.—Those in which there is a great laceration and bruising of soft tissue, the bone fragments are laid bare to quite an extent, some dirt and shreds of clothing are rubbed into the soft and bony tissues, there may be much comminution.

*Read by title fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

III.—Those in which in addition to either of the above there is multiple fracture.

The treatment rests on two things: first, surgical cleanliness! second, a correct application of mechanical principles, even to their minutest detail, in the setting of bones, the retention of the fragments and the promotion of rest and comfort of the limb.

Surgical Cleanliness.—If the patient is first seen where the accident occurred the limb should be put in a comfortable position to be conveyed to his home or to the hospital. The wound should not be touched by anything except sterilized gauze, with which it can be covered and some cotton laid over that. If sterilized gauze is not at hand use the cleanest cloth that can be secured. Nothing more should be done until the scene of permanent dressing is reached. The steps which I usually follow in the first group are these: Washing the leg with sterilized water and soap, then shaving the parts, then again using sterilized water followed by alcohol, and that by bichlorid solution. All this is done without letting any hair or seepage whatever get into the wound. This latter suggestion cannot be carried out with too much care and thoroughness. If there is much grease on the leg and alcohol is not effective in removing it turpentine or perhaps best of all a 1:20 solution of chlorinated soda may be used. I generally hold a bunch of iodoform gauze over the wound while an assistant does the cleansing and shaving. In working in the immediate vicinity of the wound I cleanse and shave from the edges of the wound. A piece of gauze is then wrung out of a 50 per cent solution of alcohol and pressed on the wound, and with it any détritus can be wiped away, not allowing any alcohol or other liquid to go into the tissues below. There should be no irrigation of the deep tissues. Do not be exploring the depths with the fingers assuming that there is, or may be frequently a piece of bone detached from the main portion, and if it remain it will cause trouble. Doing this as a matter of routine indicates a nervous and fussy habit and a panicky condition of the surgeon's mind. If there be such a fragment or fragments it can be determined by the sense of external touch, and if the surgeon wishes to remove them the wound can be enlarged and they should be removed with as little fingering of the deep tissues as possible. Personally I ignore them unless they interfere with the setting of the bone or the normal contour of the limb which is rare; and the statement that a small bit of detached bone if denuded of periosteum will act as a foreign body and interfere with the integrity of repair is arbitrary, theoretical and unverified; because an abundant experience has proved to me that such fragments denuded of periosteum or not, will be beautifully and effectively incorporated into the plastic mass which constitutes the bond of union.

We see some simple comminuted fractures where there are many fragments, some small, and it is reasonable to believe that some of them are denuded of periosteum, and yet nature takes care of them. This is the rule in simple comminuted fractures, and a properly treated compound fracture becomes a simple one.

Many years ago in Depue, Ill., a middle-aged man weighing 240 pounds fell through the roof of a large ice barge, dropping 35 feet and striking on the board floor beneath, evidently alighting on his right foot, the right lower limb being required to bear the weight of the body in its impact against the floor. The upper parts of the tibia and fibula were fractured and the lower third of the thigh was so extensively comminuted that it felt like a large bladder filled with water containing hundreds of pebbles. In this there were undoubtedly many fragments denuded of periosteum. The fracture was compound but the external opening was small. Amputation was advised but rejected. A plaster cast extending up to the hip was immediately applied. He made a good recovery. In two years there was quite a good motion of the knee, it being capable of flexion to nearly a right angle. There was, however, immense hypertrophy of the lower third of the femur.

Therefore I repeat—except where they interfere with apposition or the contour of the limb—I let Nature alone take care of the fragments. It is infection that prevents these fragments from acting kindly. Simplicity of treatment destroys the small amount of infection residing

in the wound by allowing the physiologic process to work itself out.

Of course, if one of the large arteries is ruptured it should be tied at both ends. Such an occurrence is rare. I never saw such except where a railroad train had passed over the limb and then it was a matter of destruction of the limb and a case for amputation, and does not come within the province of this paper.

However, there is a good deal of oozing from the wound of a compound fracture of the leg with small external openings, in some so much, especially when moved, as to excite the fear that the main artery is severed, but the fact that there is no bubbling up of arterial blood, and on feeling the arterial pulse in the foot it is found intact allays our fears. The novice in these cases should keep his wits about him and not start out on a tour of exploration after the supposed severed artery which will only end in subjecting the patient to serious infection.

As there is oozing for some hours after applying the dressing, as indicated in some cases by the staining of the outside of a plaster cast, the wound should be sewed up only to the extent of admitting a substance the thickness of an ordinary lead pencil. Do not insert any gauze into the opening, it dries on the outside, acts as a cork and an irritant, whereas if nothing is inserted the edges of the wound left ununited unite when the conditions of repair justify it. A little iodoform gauze is now laid over the wound. Over this and enveloping the entire surface of the leg from the ankle to the knee I apply 4 to 6 thicknesses of gauze wrung out of a 50 per cent solution of alcohol. I believe this has a great influence during the first 24 hours in controlling and preventing inflammatory processes.

Retention.—A retentive dressing is next in order. I use a plaster-of-paris cast always and without salt in it, as it sets quickly enough for me to do satisfactory work. Some use silicate of soda, dextrin, wire, etc., and all these are good, but I use plaster because it suits me best, and I can handle it best. One should use what he likes best provided he applies correct surgical principles. After thoroughly cleansing the limb, and setting the bones the great surgical principle is rest. Do nothing which infringes on the principle of rest. Do everything that conduces to rest and comfort of the limb.

Rest does not necessarily imply absolute inactivity, for the limb must be turned on its side occasionally to favor the circulation, as the body must be changed from back to side in sickness or in health while sleeping. In this sense activity is rest.

To maintain the limb in its injured state in the best physiologic condition is genuine rest. To oblige the limb to rest in one position for several days forces the blood to gravitate to a certain portion and is not rest. To have too much pressure on one portion of the limb is not rest. To have too much uniform pressure, however slight, is not rest; to leave the limb for any considerable time without efficient and complete support is not rest, and any treatment or retentive dressing that involves these defects is not correct. Therefore to apply uniform support to those broken bones and broken soft tissues not tighter at one place than another, and that as soon as possible after the receipt of the injury when the injured tissues are benumbed and the powers of repair are awakening is the ideal treatment, and the nearer we can approach that ideal the more perfect will be our results.

An immediate permanent retentive dressing giving uniform pressure and support not too tight but comfortable is the logical deduction from this reasoning. Temporary dressings of a compound fracture are manifestly defective, not the best practice and are based on wrong principles and conceptions. A lack of skill and a disinclination to acquire that ordinary skill which is within the power of attainment of every intelligent man in applying a plaster-of-paris dressing is at the bottom of the principle of temporary dressings in compound fracture. Every unfavorable result in the use of plaster in the immediate permanent dressing of these cases is due to this want of skill and common judgment.

Because many medical men bandage too tightly we hear, "Wait until the swelling goes down." But it will not go down, or at least it will go down only slowly while the pathologic condition of unrest and its resulting mobility

exist. Those who would bandage others should first bandage themselves. Bandage your own fingers, hand and forearm up to the elbow, lay the member on a pillow for a while and you will be surprised that the member is cold and a little numb and uncomfortable. Put a cast on your leg or have your medical friend do it and you will find it very tight. Learn to apply it so that it will feel as a comfortable fitting glove or shoe. When you buy a pair of shoes and they are comfortable from the start you are wise, but if you have to break in a very tight pair you are very uncomfortable, but when you make a half dead leg try to break in an excruciatingly tight, unyielding plaster cast no wonder that immediate permanent dressing will come into disrepute.

Now a few words about temporary dressings: When you put on side splints you have only side pressure and it must be unphysiologically tight to immobilize the limb. The bandages to hold these splints give only imperfect posterior support. A dressing for a fractured leg must furnish substantial posterior and lateral support. Bags along the side of the limb and a mattress or pillow underneath does not give support; the legs are running away from the bags continually or the bags from the legs; immobility is not preserved, the bones are pressing on the wounded soft tissues, circulation and nutrition are limited, you have no physiology, you infringe on rest and the swelling of the limb is kept up for a long time.

There is a traditional fear in the minds of many medical men regarding the use of a permanent primary dressing. This is reflected in modern text-books on fractures and again reflected on the members of our profession like an endless chain, but if you analyze the subject well you will find that this fear originated in—and has come down to us in a classical way from those days in which there was little skill possessed in the application of a primary dressing.

One of our most popular books on fractures says, "You must assume that every case of compound fracture of the leg is an infected one, therefore apply a temporary dressing until the swelling goes down, and in one or two weeks apply a permanent plaster-of-paris dressing." Why, because of the assumption of infection, a temporary dressing should be used, and why we should wait one or two weeks for selling to go down is not made clear. It is a clinical fact that in all cases that are capable of being saved, there is a noticeable diminution of swelling in 24 hours, and in four or five days all anxiety as regards the element of swelling is entirely removed, providing the medico-legal injunction of "reasonable care and ordinary skill" is observed in the application of a primary permanent plaster dressing. In cases where the immediate dressing is permanent I have observed that the swelling goes down very quickly because of the presence of physiologic conditions; in delayed dressing it goes down slowly by the force of nature in spite of unphysiologic conditions, sometimes involving complications of pus, slow convalescence, and delayed union. The great usefulness of permanent dressing is not in the second stage, but in the early stage, the period of greatest need, when immobility by uniform support without undue pressure should be established, when the traumatism should be relieved of its greatest danger, that of interference with the circulation. The severer the case, the greater the need for such action. Few parts of the body heal more quickly than the leg if it is given proper position and rest; none heal so slowly if these conditions do not exist. Eight weeks' rest in the recumbent position cures extensive varicosis and ulcers of the leg.

In the first group, cleanliness and the immediate application of rest, if the wound is not tampered with by irrigation and unnecessary exploration, will enable the germicidal power of the tissues to destroy the small amount of infection that may exist, and will give glorious results.

After an experience of twenty-five years with a large practice in such cases in a region where there is extensive coal mining and large zinc and Portland cement manufactures, and being also local surgeon for three railroads—I have never seen a case of the first group where I rendered the first service in which there was any untoward results and where they did not pursue the same favorable course as witnessed in simple fracture of the leg.

I rarely use windows in a cast in my own cases belonging to the first group. They are not really necessary in properly treated compound fractures of this class. I usually open up the cast by removing a longitudinal section the whole length of the cast 2 inches wide in 10 days, as in an abdominal case, and generally find the wound thoroughly healed; sometimes on account of the rapid diminution of swelling this must be done in 6 to 8 days. The cast can then be made snug by the use of muslin bands. If, when a person applies a plaster cast, however mild the case may be, he fears it may be too tight, he should make this longitudinal section in half an hour to an hour after its application and loosen it a little along its whole length by inserting his thumbs under its edges.

The second group of cases should be carefully cleansed, thorough drainage and counter drainage if necessary should be established, all comminuted fragments removed, and the bones be sutured if deemed advisable. An immediate dressing of plaster-of-paris should be applied and an anterior longitudinal section 2 or 3 inches wide always removed. Great care should be observed to have the cast loose enough and very comfortable. In the great majority of cases for subsequent dressings the parts to be dressed can be reached through the longitudinal section. If, however, the external wounds are located further back their location should be marked with a lead pencil on the outside of the cast immediately after the first dressing and the creation of a window be delayed until the second dressing, it not being needed until then and the patient being tired, his strength should be conserved.

In many of this group and in all of the third group of cases a posterior felt splint placed under the cast is advisable. These splints being firm and strong admit of windows being made in them without seriously lessening their quality of support. In 3 to 4 weeks these can be removed and a new plaster cast alone can be applied. In all cases in 3 or 4 weeks, motion should be instituted in the ankle and knee joints with stroking of the limb to help the circulation, and a new splint extending only to the knee applied. In 6 weeks the splint can be left off during the night, to be applied again in the day. It is probably not safe to allow the patient to walk freely until 9 or 10 weeks. I saw two cases that were permitted to walk in 7 weeks and in one week afterward there was marked displacement of fragments and permanent deformity.

In the setting of bones and in applying a dressing an anesthetic should be given in all cases difficult of reduction, in strong men with powerful muscular contractions; where there is persistent protrusion of an end of one fragment; where there is suspicion of interposition of muscle; and in all cases of much laceration requiring operative procedures.

I am not prepared to say that an anesthetic should not be used in every case of compound fracture of the leg.

In the application of plaster-of-paris some points must be noted: The part of the limb to be enveloped should extend over the table and should be free from it. It should be held by one person holding the foot and another steadying the knee. I always hold the foot, while my assistant who has thoroughly learned the simple art of not bandaging too tightly, applies the cast. To hold the limb gently but firmly throughout the operation using sufficient intelligent traction is a trying effort. There is a continual slight displacement of fragments, both lateral and antero-posterior, the latter due to overextension, which must be most guarded against. As in setting the bones, alignment must be kept in mind. Scudder says, "The inner side of the great toe, the middle of the patella and the anterior superior spine of the ilium must be in one straight line."

The most important guide, however, is one's conception of the normal contour of the limb compared with the corresponding one. To avoid tightness and yet give proper support is our object. An ordinary pound roll of cotton is 12 inches wide. After unwrapping it I cut it longitudinally making it half width. A roller is made out of this and it is used in bandaging from the toes to a point a little above the ankle. From this point up to the middle of the thigh full width is used. This is kept in position by applying gauze bands at intervals of 5 or 6 inches tied with a single

knot; only a single thickness of cotton should be used for padding. I use a crinoline roller 4 inches wide and 7 to 10 yards long. The sizing or glue in it is of no consequence. The ordinary prepared plaster rollers sold by the different pharmaceutical houses are satisfactory. Salt, 1 teaspoonful to 2 quarts of water, may or may not be used. I dispense with it as the cast sets quickly enough without it. The depth of water in vessel should be sufficient to cover the roller as it stands on end, When the roller stops bubbling it is ready for use.

Beginning at the toes encircle the limb at any point only once, letting the roller extend up as high as it can reach, which is about the entire length to be enveloped. As one hand winds the bandage the wet palm of the other hand should follow, gently pressing at every point the plaster into the meshes of the cloth. This can be done 3 to 5 times which will be about the same number of rollers, 3 to 5, applying greater thickness to those parts requiring more support. The traction on the bandage should be scarcely more than the weight of the bandage material, just enough to cause a gentle appreciable resistance from the cotton beneath.

The foot should be held at a right angle. In Pott's fracture, in addition to this, it should be slightly inverted. The best thing to cut the cast which I have ever used is Engel's saw.

To briefly sum up: Observe rigid cleanliness. In the first group of cases avoid unnecessary interference, letting Nature, who is a good surgeon, do her share of the work. Always apply a permanent primary dressing using whatever kind of splint material you can handle best and in such a way as will give efficient uniform posterior and lateral support ever keeping in mind and having the strictest regard for the great principle of rest.

THE EFFECT OF EXTERNAL INJURY IN PRODUCING APPENDICITIS.

J. H. BATTLE, F. R. C. S., LONDON.

A very interesting question is the influence of the presence of a fecal concretion in determining an attack of appendicitis after injury. Kelly collected a series of 50 cases in which it was alleged that an attack resulted as a consequence of injury. "In the majority of cases pain was complained of immediately or else within a few hours. It is noticeable that whenever an interval of weeks or months elapsed between the accident and the well-defined symptoms of appendicitis there were more or less well-marked symptoms of continuous digestive disturbance or, on the other hand, there was a history of repeated attacks following the injury before the patient came under observation for appendicitis." "In 40 out of my 50 collected cases the appendix deviated in some way or other from the normal and 30 out of the 40 abnormal appendices were noted as containing concretions; in 7 of the remaining which were without a concretion there was evidence of old adhesions; of the last three, one was flexed on itself, one was cystic, and one was unusually short and wide. No case has as yet appeared in which it has been shown that an injury *ab externo* has produced an appendicitis in a previously normal appendix."

The importance of this question will probably be more evident to all when the new Employers' Liability Bill, with its more comprehensive compensation clauses comes into operation, for it is not unusual to find acute appendicitis as well as more serious conditions, such as perforations of the digestive tract, ascribed by the domestic servant to strain or to overlifting. Now how much more will this be the case when the statement may carry with it a large sum for compensation to the sufferer or her friends. Cycling and motoring have been freely accused of causing appendicitis, but there is nothing in my experience that is so potent a factor in developing that condition, when latent, as the riding of a motor bicycle. Here, again, there is pre-existing disease of the appendix.

In some instances the concretion contains some foreign substance which has been caught up and hidden in the hardening mass after its entrance into the appendix. In all probability many a wanderer beyond the valve of Gerlach is swept back again by a gust of fluid from the irritated chamber into which it has intruded so unexpectedly and passes away with the stream outside, leaving no evidence of its visit.—*Lancet.*

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ANNUAL MEETING.

The fifth annual meeting of The American Association of Railway Surgeons will be held in Chicago, October 14, 15 and 16, 1908.

MEETING OF EXECUTIVE BOARD.

At a meeting of the Executive Board, held in Chicago January 17, Dr. D. S. Fairchild was re-elected chairman. The date of the annual meeting was fixed for October 14, 15 and 16, 1908.

In addition to a continuation of the Symposium on "Trauma as an Etiologic Factor," another one is being arranged for on "The Primary Treatment of Wounds."

TREATMENT OF TETANUS BY MAGNESIUM SULPHATE.

About two years ago Meltzer of New York recommended magnesium sulphate for spinal analgesia. He claimed as a result of experiments on animals that by local application of this agent to nerve trunks the conductivity and excitability can be temporarily abolished.

As a corollary it was recommended for tetanus. J. N. Henry, in a recent number of *International Clinics,* gives the details of 4 cases in which it was used. There was but 1 recovery, though the case was a severe one. In a second case the short incubation and acute onset presaged a fatal termination, which occurred. The next case was one of the most acute and most severe the author has ever seen, and at no time did he feel the patient had any chance of recovery.

The last case was disappointing and Henry asks if the drug itself did not contribute to the patient's death. If tetanus can ever be called mild—then this was a mild case of subacute type. He suffered from bronchorrhea as did another case in the series, and while Meltzer attributes this as part of the picture of tetanus instead of the drug effects. Henry states in the two cases referred to, the condition seemed to be produced and aggravated by the drug.

Concerning the effects from the treatment Henry believes there is a prospect of at least rendering the patients comfortable, and of giving euthanasia in place of a dreadful end. There is another phase—he states—Meltzer's

animal experiments would go to show that there is delay in the appearance of the symptoms as well as a delayed death. It may be that this delay may be used to administer anti-toxin with more success than at present attends serotherapy.

Other successes are reported by G. C. Robinson* and H. Greeley.** The former used it in a boy of 11. The latter author treated a boy of 2 and a man of 45.

Correspondence

NELIGH, NEB., Jan. 9, 1908.

To the Editor:

In the December issue of the RAILWAY SURGICAL JOURNAL, page 124, second column, the last paragraph should read: "I believe that in these cases we *never* have a primary tuberculosis of the synovial membrane."

I should like to have this correction made, as I have always adhered strongly to this fact and am sure that Dr. J. B. Murphy was correct when he took this position. Very truly yours,

D. W. BEATTIE.

DANGER SIGNALS IN ANESTHESIA.

Johnstone states that dangerous conditions in anesthesia show themselves in the following ways: (1) Obstruction to respiration due to foreign bodies such as blood, mucus, loose teeth, congestion of the tongue, or fauces, spasm of the muscles of the neck, collapsing cheeks, laryngeal spasm, and general respiratory spasm. (2) Depression or failure of respiration. (3) Depression or failure of circulation. These last two effects, he asserts, may be due to the toxic action of the drug, reflex effect of the operation, or the physical condition of the patient. Depression and even failure of the circulation may arise from vomiting, but occurs more frequently with chloroform than with ether.—*Canadian Practitioner and Review.*

Cancer of the pancreas attacks the head of the gland six times more frequent than the tail. —*Bland-Sutton.*

*Journal American Medical Association, Aug. 10, 1907.

**Ibid,. Sept. 14, 1907.

Translations

FRACTURE OF THE TUBERCLE OF THE TIBIA.

[Translated for THE RAILWAY SURGICAL JOURNAL.]

Fracture of the anterior tuberosity of the tibia has been considered rare. At the present time, owing to the use of the x-rays, the diagnosis is easier than in the past. So much is this the case that J. E. Jensen has observed 10 cases in a short time; he was also able to find 40 others reported in the literature.

Fractures of this part of the tibia are closely related to the development of the bone. The tubercle has a separate centre of development after—on the average—the 12th year. This joins to the rest of the epiphysis in a short time, 2 to 3 months; there is a cartilaginous layer intervening, which disappears between the 18th and 20th years, 25 years or even later. The late appearance of this bony centre and its rapid union with the upper end of the tibia, explain why some authors, before the days of x-rays, considered its ossification as a prolongation from the upper epiphysis.

Fracture of the tubercle of the tibia nearly always occurs in subjects from 12 to 23 years of age (42 out of 46 cases). In reality it is more an epiphyseolysis than a fracture; it may be complete or incomplete. In the former case, the tubercle rises up on account of contraction of the quadriceps; in favorable cases, however, this ascent is limited by the intact fibrous tissue from the tendons or aponeuroses in the vicinity. In the 10 cases observed by the author, 8 were incomplete and 2 complete. The incomplete fractures were also in the majority in the cases collected from the literature. All the subjects were males, save in one case. The determining cause is above all muscular, hence it is a "tear" fracture, due according to the case to sudden contraction or flexion. Among accidents giving rise to these fractures, foot ball is one of the most important. The right side is most often involved, which can probably be explained by the stronger musculature of that side of the body.

Incomplete fracture is characterized by a sudden sharp pain. In some cases it is so violent the patient becomes helpless; in slighter

cases, on the other hand, the pain may disappear or be forgotten, so the patients claim the condition has come on gradually. In all cases the pain is brought on by exercise, and brings the patient to the surgeon, if he has not already made a visit at the time of the accident. At this time there is found swelling and tenderness over the tubercle of the tibia, the latter often forms an elevation when the knee is flexed, occasionally this is movable. The hematoma is more or less early in appearing, according to its abundance, it is generally located below the joint.

In the complete fractures which are generally accompanied by a cracking sensation, pain is extreme and helplessness very marked. The swelling—semilunar in shape—surrounds the patella, but as the line of fracture sometimes runs into the joint, there is often added swelling of the knee as a whole. The hematoma extends down to the middle of the leg and above to the lower fourth of the thigh. The patella is lifted up 1½ to 2 inches above its normal position and is much more prominent than usual. Two or 3 inches below its lower border is a bony tumor, adherent to the patellar ligament and moving with it, and which may be displaced in all directions. In some cases the tuberosity is on a level with the joint. Lastly there is a depression where the tubercle should be found. It is hardly necessary to add these signs are more evident the more recent the fracture, after some time they are masked by swelling. When the possibility of this fracture is not borne in mind, it may be mistaken for displacement of the cartilages, hygroma, laceration of the patellar ligament, and especially fracture of the patella itself. As regards the 2 latter lesions it is well to remember that fracture of the tibial tubercle is met with in subjects of from 10 to 20, while fracture of the patella is generally found in patients from 30 to 40; and rupture of the patellar ligament in subjects in the vicinity of 50.

Restitutio ad integrum is rare, even in incomplete fractures, and, of course, much more so in the complete variety. The latter as in fractures of the patella generally unite with fibrous union and there is more or less difficulty in locomotion.

Treatment of the incomplete fractures consists in rest, compression and massage; if the patient is able to walk, he may be allowed to do so, taking great care to avoid any mishap which would tend to change the fracture into the complete form. In cases of total separation of the tubercle, the fragment must be reduced and kept in place, using for this purpose apparatuses similar to those from fractured patella. If, however, the fragment is engaged in the joint, Jensen believes it is better to perform arthrotomy and bone suture.—*Semaine Medicale.*

DANGERS FROM DUST.

Lyman A. Best, president of the Brooklyn Teachers' Association, in his last annual report, gives the results of investigations made regarding contagious and infectious diseases in the public schools. Dust and feather dusters, he says, are the principal means of infection among school children. Figures are given from 1898 to 1906, inclusive, covering measures, scarlet fever and diphtheria. The schools are visited every two years by an epidemic of measles, February and March being usually the record months. In January, February and March, 1898, there were 6,921 cases of measles. The number decreased during the year until in July, August and September there were only a few more than 100 cases. In 1899 there were only 2,667 cases during the first three months of the year. There was a well-developed epidemic in 1900, January showing 3,299 cases; February, 3,473, and March, 3,742. The next year there were only 421 cases in January, 640 in February and 1,256 in March. In 1902 there were 3,353 cases in January and 3,872 and 3,371 during the next two months, respectively. There were only 647 cases in January of the next year, 834 in February and 1,212 the next month, but in 1904 January, February and March showed 3,460, 4,438 and 7,112, respectively. In 1905 there were only a few cases.—*Chicago Medical Recorder.*

Cases have been reported in which *gall stones* have been found broken up in the gall bladder. No satisfactory explanation has been advanced to explain this condition.—*Bland-Sutton.*

Extracts and Abstracts.

THE RELATION OF TRAUMA TO GENERAL PARALYSIS.

Brissaud draws attention to the importance of the relation of trauma to general paralysis since the passage in France of the law of 1898, regarding accidents.

The vast majority of physicians in Germany and England deny absolutely that any etiologic influence can be assigned to trauma. A very few maintain that sudden shock or injury may give rise to the production and evolution of general paralysis.

During his nineteen years of service as medical expert for railway companies employing 14,000 workmen Brissaud has never met with a single case of authentic traumatic general paralysis among the many cases of injury that he has been called upon to examine. There were numerous cases of serious traumatic neurasthenia, railway brain, melancholia, etc., etc., the immediate cause of which was cerebral commotion, but of true general paralysis, progressive and fatal in non-syphilitic subjects, not one. His experience then leads him to insist, in face of arguments advanced, upon the exclusively infectious nature of general paralysis.

In a recent report there appeared the history of a case with the conclusions of which Brissaud takes issue: A man, having received a blow upon the head, without a wound, without mental confusion, without ecchymosis, became some months later a general paralytic, and died some five years later in an asylum. The expert examiners, says the writer, had never seen him, but they examined his wife and children and found no stigmata of syphilis. The relations and friends were unanimous in their statements as to the normality of his mental faculty before the accident, but very contradictory as to the time of the first appearance of cerebral troubles. Yet in the presence of the negative results of this retrospective examination, at a distance of six years, these authorities concluded that the accident was the sole cause to which the general paralysis could be attributed. The information thus gained seemed to the examiners to establish the fact that this trouble conforms to a peculiar law, that such general paralysis should reveal itself neither too short nor too long a time after the accident.

Brissaud cites two cases of general paralysis within his own experience, in which the symptoms of the disease appeared in the patient upon the very day of the accident. In the first case, immediately following a wound in the eye there developed the paralytic syndrome and the patient died in a convulsive attack at the asylum. The second patient after a fall was attacked the same day with convulsions attended by noisy delirium. In two or three days he was sent to the asylum where he now is. In this case the findings was one of general paralysis.

Could not one conclude that the general paralysis, the symptoms of which appear on the day of the accident, existed before the accident? For an accident cannot suddenly at any moment or other cause a lesion of evolutive character, progressive, slow and fatal. The accident only offers a favorable opportunity for the disease until then latent, to reveal itself. This reasonable view that a certain chance condition may suddenly reveal a pre-existing morbid state is decidedly at variance with the theory that an accident can give rise to general paralysis after the period of incubation, "neither too long nor too short."

In cases of serious injury, where the doubt may profit the injured, the writer is one of the first to urge compensation, but he objects to the conclusion "Post hoc, ergo propter hoc."

Brissaud's conclusions then are that (1) trauma cannot give rise to general paralysis, (2) that it simply acts as a provocative agent bringing to the surface a hitherto latent condition; and (3) that general paralysis is undoubtedly the result of toxemia.—*St. Paul Medical Journal.*

A FORMULA FOR MAKING SPLINTS.

CHARLES H. GALLAGHER, M. D., SLATERVILLE, NEW YORK.

This formula, for the manufacture of a firm, durable splint—very valuable in the fixation of certain fractures after the swelling has sub-

aided—has been sold to many physicians for $10 or more:

Powdered starch	oz. 1
Isinglass or gelatin	oz. 1
Solution of potassium silicate	qt. 1
Pulverized boric acid	oz. 1-2

Mix the starch with the solution of silicate of potash by shaking from a pepper-box and stirring constantly till mixed.

Reduce the gelatin to the consistency of mucilage with boiling water and mix well with the first two. (Better soften with cold water first.) Then put into a jug of double the capacity and ferment at room or sun temperature for three or four days. Then add the boric acid, mix well, and it is ready for use.

If too thick after standing, thin it with boiling water. Keep corked. Apply a silk stocking or roller bandage; then a coat of the preparation with a brush, and repeat till three or four layers are applied or until the splint is thick enough. It may be cut after hardening and eyelets and laces put in.—*American Journal of Clinical Medicine.*

In patients suffering from *tuberculous disease* it is well known that operation on local tuberculous foci may be occasionally followed by dissemination. It is impossible to foresee such a deplorable consequence, and the great majority of such operations are well borne. In patients with pulmonary tuberculosis the effect of the disease on operative procedures elsewhere depends on its stage. In florid phthisis, radical procedures not involving a long convalescence are preferable to the more conservative; but when the pulmonary disease is not active the latter measures are more justifiable. Ether as an anesthetic is generally to be avoided for phthisical subjects. Circumscribed tuberculous foci of the intestine which are interfering with nutrition should be operated on, even when there is pulmonary disease, provided that the intestinal lesions are not too advanced; this particularly applies to stenosis and abscess.—*Schlesinger.*

Notices and Reviews.

On Diseases of the Rectum and Anus, Including the Fifth Edition of the Jacksonian Prize Essay on Cancer, by Harrison Cripps, F. R. C. S., Senior Surgeon St. Bartholomew's Hospital, etc. Third edition. 588 pages, 15 plates, 34 illustrations. Chicago: W. T. Keener & Co., 1907. Price, cloth, $4.00 net.

Two previous editions of this valuable work has been before the profession, and surgeons who have given attention to diseases of the rectum are already familiar with the name of the author.

Only a few pages are given to anatomic and physiologic considerations, enough, however, to call attention to certain landmarks which the surgeon must have first in mind and to some anatomic findings which Mr. Cripps has himself marked out.

In the chapter on "Examinations in Rectal Diseases" most valuable directions are given. Cripps in a particular manner draws attention to a dependence on the "educated finger" in diagnosis instead of the speculum, which should never be employed unless the patient is under an anesthetic. Before an examination is made the bowels should be cleared out by a mild purge. It seems easy to make a thorough examination of the rectum, but many mistakes in diagnosis are made because of a disregard of a few important facts in preparation and too great a reliance on the speculum.

A very full chapter is given on "Hemorrhoids" and is worthy of careful reading. It is not always convenient for the patient to undergo an operation and he will be anxious to secure treatment at the hands of a physician temporarily at least. The general practitioner will find much useful help in perusing this chapter. Mr. Cripps, contrary to the practice of most American surgeons, prefers the ligature to the clamp and cautery in the radical treatment of hemorrhoids. We do not think Cripps' method of using the clamp and cautery is a good one, it invokes too much risk of hemorrhage. The author's method is to firmly secure the pile in the clamp. This having been attended to, the mucous membrane beyond the grasp of the clamp is cut off, either by scissors or divided by the heated knife. In doing

this care should be taken not to cut too closely to the clamp blades. The accidents from hemorrhage which have come to our knowledge have been in the hands of men who have adopted this method or have used too hot a cautery. The Whitehead method is properly condemned.

The chapter on "Prolapse of the Rectum" is interesting and very practical. In treating chronic prolapse the method which we have employed for several years is recommended, viz.: the actual cautery. Pull the mucous membrane well down and apply the cautery, tracing in shape of a horseshoe in nearly a circular direction, leaving the open space in front. This can be repeated at three or four points. The burn should be deep enough to include the mucosa and with the iron at a dull red heat. Excision is a severe and dangerous operation and should be used only in exceptional cases.

"Rectal Abscess" and "Fistula in Ano" receive a fair degree of attention. In operations for fistula warning is given of the possibility of incontinence if care is not observed in dividing the sphincter. These accidents are not infrequent in the hands of surgeons who operate but seldom. It is believed the high division of the muscular fibres of the bowel is the commonest cause of the want of control. In concluding Mr. Cripps observes that "It will be very seldom necessary to divide all the coats of the bowel to any height. "Anal Ulcers and Ulceration of the Anus and Rectum" are fully treated.

"Non-malignant Fibrous Strictures of the Rectum" receive very careful consideration and much valuable advice is given especially in regard to examinations when the temptation is sometimes strong to push the examining finger through the stricture when the sensation of yielding is felt. Several deaths have occurred from rupture of the bowel and escape of the contents into the peritoneal cavity.

Nine of the twenty-four chapters are devoted to "Cancer of the Rectum." Mr. Cripps has devoted space to this disease commensurate with the importance of the subject. Careful consideration is given to the conditions which may indicate or contra-indicate operative procedures, and a large and thoughtful experience is brought to bear on the kind of operation suited to particular causes. This book will certainly interest the general practitioner as well as the surgeon. D. S. F.

"A Treatise on Diseases of the Skin." For the use of advanced students and practitioners. By Henry W. Stelwagon, M. D., Ph. D., Professor of Dermatology, Jefferson Medical College, Philadelphia. Fifth edition, revised. Octavo, 1,150 pages, with 267 text-illustrations and 34 full-page colored and half-tone plates. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener & Co. 1907. Cloth, $6.00 net; half morocco, $7.50 net.

The fourth edition of this work was issued some two years ago. The present edition has been overhauled and enough obsolete matter removed, so that the additions in text and illustrations only increase the bulk of the work about fifteen pages.

The changes and additions are principally to be found in the articles on skin diseases met with in tropical climates. For example, new articles are found on washerman's or dhobie itch, and the dermatitis from the hook worm-uncinaria. The articles on frambesia and oriental sore have been revised, as well as those on verruga and tinea imbricata.

There are thirteen new cuts and two plates, and here again the tropical diseases have been laid most under contribution. J. J. Q.

"Diseases of the Genito-Urinary Organs and the Kidney," by Robert H. Greene, M. D., Professor of Genito-Urinary Surgery at the Fordham University, New York; and Harlow Brooks, M. D., Assistant Professor of Pathology, University and Bellevue Hospital Medical School. Octavo, 536 pages, profusely illustrated. Philadelphia and London: W. B. Saunders Company. Chicago: W. T. Keener, Son & Co. 1907. Cloth, $5.00 net; half morocco, $6.50 net.

In this volume of 504 pages, much of the space taken up by illustrations, an attempt is made to cover diseases of the genito-urinary organs. We learn from the title that the authors do not consider the kidney part of the genito-urinary system. We do not remember to have seen this distinction before.

In the preface the authors inform us they do "not profess the book is complete, this would be impossible in a work of this size." They then proceed to devote a whole page to the embryology of the kidney and 6½ pages to the anatomy, 10 pages to the examination of the urethral exudate, etc.

Also (page 84), "The technic of urinary examination is now so fully described in numerous special text-books that with the limited space at our disposal it seems unnecessary to consider this subject in detail." Notwithstanding the limitation of space, 17 pages are taken up with a consideration of urinalysis.

In the tests of kidney function only phloridzin and indigo-blue are referred to, nothing is said as to indigo-carmine, which is by some competent authorities considered better than either of these, nor are electric conductivity or the physiologic test alluded to.

Figures 86, 87, 88 and 89 are copied from Hartmann's work, though no credit is given and some of the others are redrawn from the same work. The English author Kelynack is invariably misspelled Kélynack. We fail to see any pronounced advantage from the combination of a pathologist and surgeon in a work of this nature, and believe it would have been much more profitable to devote the whole of the work to the kidney, leaving to another volume the rest of the organs touched on. J. J. Q.

Personal

Dr. F. W. Ewing has been appointed local surgeon for the Rock Island System at Terrel, Tex.

Dr. H. B. Jennings of Council Bluffs, Iowa, secretary and treasurer of the A. A. R. S., has been elected delegate to the State Medical Society.

At the recent meeting of the Western Surgical and Gynecological Association, Dr. W. W. Grant, of Denver, surgeon of the Rock Island System, was elected president; Dr. H. A. Sifton of Milwaukee, surgeon for the North Western lines, vice-president, and Dr. C. H. Mayo, member of the executive council.

Society of Railway Surgeons of the Pacific Coast.—The following were elected at the fifth annual meeting: President, Dr. John R. Colburn of Los Angeles; vice-presidents, Dr. G. A. White of Sacramento and Dr. F. L. Adams of Oakland; secretary, Dr. J. P. Dunn of Oakland.

Under the care of Dr. Carl E. Black, of Jacksonville, Ill., the library of the Morgan County Medical Society has become one of the best selected medical libraries in Illinois. Since the society has been given a separate room at the public library they have employed a salaried librarian and today the library is completely catalogued and indexed. The leading medical journals are taken and articles classified, and since this system has been introduced keener interest in the library has been aroused in all members of the society, and not only has greater personal use been made of the books on the shelves, but many physicians have been induced to donate volumes to the society and the collection has assumed large proportions with many rare and choice works on the subject of medicine and surgery. At the close of the year 1,729 volumes were in the library, and 28 periodicals in the English language are subscribed for, each of these will be indexed as soon as it arrives in the library.

The appointment of Dr. James G. Hunt of Utica, N. Y., as a pension examiner gives general satisfaction. He was named by Commissioner of Pensions Warner, to succeed Dr. F. H. Peck, who has been appointed health officer under the new administration. A coincidence connected with his appointment was that Dr. Hunt some years ago, during his term as health officer, was tendered the position as pension examiner, which he accepted. A few months later he resigned as examiner on account of a ruling that he could not hold the office. A few days ago Dr. Peck resigned his position as examiner to assume the position as health officer, therefore he surrendered his office as pension examiner in the same way that Dr. Hunt did some years ago. Dr. Hunt had an excellent record as a health officer. He was appointed June 12, 1874, and served in that position for a period of 15 years. On March 29, 1889, he was appointed pension examiner, but later surrendered that office. He later served five years more as health officer, making in all 20 years.

Intra-cranial gummata may cause severe neuralgia, which, as a rule, is curable by iodids.—*Hutchinson.*

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In this scientific age no railway surgeon, who desires to protect the interests of the company by which he is employed, should attempt to practice surgery without equipping himself completely, and he certainly is not completely equipped unless he can at any time hand to the jury a precise skiagraph of the injury. How many medico-legal cases are lost? How many damage suits are paid, because the surgeon could not supply the railway attorneys with the proper evidence, when for a few dollars he could have supplied the most convincing facts in a most plausible manner.

The writer who has for several years made careful observation of railway surgeons in various parts of the U. S. has noted with much interest the greater success and progress being attained by surgeons believing in the utility of those things which make far greater strides in the practice of surgery, or in other words, "Simply believing in being always ready."

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The process of manufacture, of course, is not known, but is supposed to be the result of experiments with sulphuric acid on tissue paper pulp. Huston's Xylonite is very light and has the advantage over all metal splints of not rusting. The surgeon will appreciate the fact that its rigidity enables him to cut windows in it with freedom. In orthopedic cases, where a strong material is required, and at the same time one that is very light, Huston's Xylonite is perfectly adapted.

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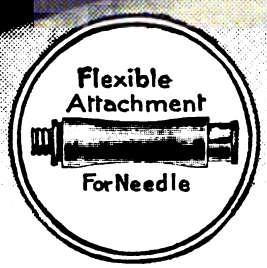

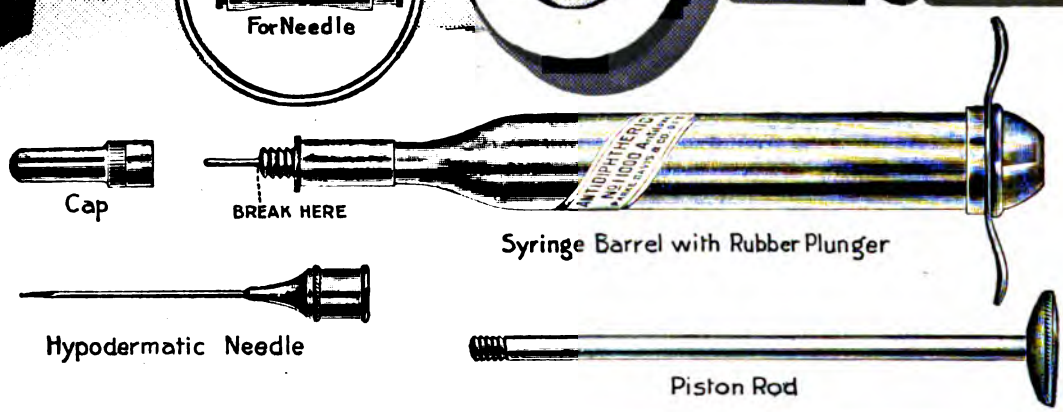

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The Railway Surgical Journal

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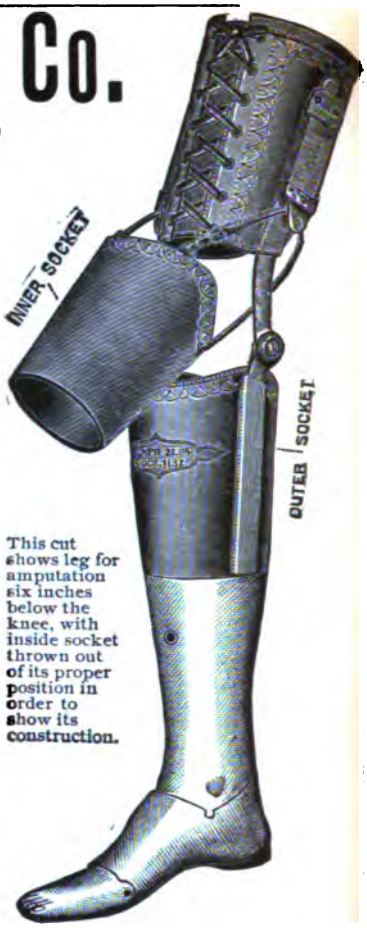

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THE Railway Surgical JOURNAL

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INJURIES OF THE HAND.*

W. H. BALDWIN, M. D., MEMPHIS, TENN.

In the service of a number of industries engaged in the manufacture of various products, principally wood and iron, my attention has been directed to the injuries of the hand. From detailed records available it is estimated that 10 per cent of the employes of wood working institutions receive injuries requiring surgical attention, and that 40 per cent of the injuries treated are of the hand (of which 75 per cent are of the right hand), and 97 per cent include the fingers.

The greater number of cases come during January, February and March, owing to the increased number of employes during that period, which include a number of persons unfamiliar with the work, and on Monday morning between the hours of 8 and 11 o'clock.

The injuries include all ordinary forms of trauma, viz.: sprains, fractures and dislocations, and contusions. The greater portion, however, are wounds, the majority of which are of the lacerated and contused variety, and to this class particular attention is directed. Incised wounds are infrequent, the third or knuckle joint is the usual seat of injury, including the principal extensor tendon. Compound fractures, complicated by dislocation come in with a liberal share, the thumb with equal frequency, and crushed wounds may well be included with the lacerated and contused. The greater number are in the form of mangled fingers, received from saws and planer knives, and the degree of traumatism is in a measure due to the speed of the machine, the higher speed machine doing more injury by the extesion of fractures and the concussion of soft parts.

Practically all are infected wounds and vary in degree in a surprising manner, according to the kind of material handled while at work. Those employed on log yards, and who handle wet timber, with the bark on, suffer more severely with infection, than do those who handle square timber, and the worker of soft woods (cottonwood, gum, etc.) more than oak and other hardwoods. The tannin in the sap from the oak is probably the responsible factor. Clay workers, in brick yards, and potters suffer extensive infection, and the other extreme is the rule in the case of the greasy-handed blacksmith and machinist.

The general health of workmen of this class predisposes to the infective process, as they are usually recruited from the ranks of those who have been unfortunate in other lines of business, or have been led to follow the occupation from early apprenticeship. The cost of living is generally disproportionate to the income, and with it that degree of intemperance which usually makes up a part of their recreation, to which is added that impoverishment due to syphilis and malaria. Since the infection is usually from organisms of low virulence and

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

gives inflammatory exudate time to organize and thus form a barrier to further invasion, the symptoms of septic intoxication may not arrive for several days. Previous history of recent malarial paroxysms, and the knowledge that the depression from shock and hemorrhage will bring about such a condition, will frequently mask the suppurative process.

The information in regard to provisional dressings, possessed by the average individual, or his fellows, has relieved us of one source of infection, which was formerly the rule. Their untoward efforts to check light hemorrhage, has no doubt played an important part by temporarily devitalizing the tissues, thereby making a favorable location for the lodgment of pus-producing bacteria. It is difficult to find the hands of workmen free from some small area of infection, more frequently around the base of the nails, or in abrasions about the knuckle joints.

So much has been said, and proved, of the various methods of disinfection, and we have such implicit faith in their value, that the signs of sepsis are accepted with a deal of self-reproach. The selection of a disinfectant is not an easy matter, and the satisfaction and confidence received in the application of one method, will in due time be shaken by the rude offender.

The plan which has given me best results has been to give instructions to envelop these open wounds in a suitable sized pack of clean gauze, which may be kept at some central portion of the shop, usually in the foreman's desk, well secured with a bandage, or pocket handkerchief. I have not found it satisfactory to attempt to do more than apply the provisional dressing at the shop. The wounds are seldom attended with shock, and the patient can, in a very short time after injury, report to the office —which is to be preferred to the home—for attention.

As the clothing of these workmen is usually filled with dust and mill grease, a metal operating chair of late design is to be preferred. After placing the patient in a chair, suitably reclined, and providing him with a small basin in which to rest the injured member, it is well to inquire if he has been furnished with alcoholic stimulants, and at that time to receive any detail, and record same for reference, preferably on a card designed for the purpose, embracing name, age, color and domestic situation, his address, name of employer, and the date and hour injured. This is a time-saving feature, and lends material aid in making casualty and personal accident or liability insurance reports.

Varying degrees of sensibility will regulate the demand for the hypodermic administration of morphin as an analgesic.

The general plan which I follow at this time, is to bare the arm to the elbow and thoroughly cleanse all parts, not enclosed in the provisional dressing, by scrubbing with hot water and green soap, after which the surfaces are shaved, and rinsed with plain water. The wound is then exposed and washed out by irrigation. Troublesome hemorrhage is checked by a small gauze sponge held with pressure by an assistant, the field cleared of any oily matter by sponging with gasoline, after which, when cleansed with green soap and hot water, it is then determined that the injury is of sufficient degree to demand an anesthetic, the hand and forearm is enveloped in a pack wet with a solution of bichlorid of mercury, 1:1000, during the time of preparation.

The condition of the tissues makes the application of popular methods of local anesthesia impracticable. General anesthesia (chloroform being preferable in these cases), after careful physical examination and attention to details for comfort, by a competent assistant, is generally satisfactory. The common practice of entrusting the administration of a general anesthetic to one unfamiliar with its danger is discouraged.

Insensibility to pain having been secured, satisfactory examination and disinfection of the wound may be obtained, and at this time the judgment of the surgeon will be subjected to a very severe test. The comparative wage-earning value of a hand with a deformed finger, or weakened by its absence, is not an easy problem to solve. Inquiries to the heads of various departments bring replies to estimate the loss of the index finger of either hand at a reduction of 10 per cent, or two fingers from either hand

at 25 per cent, the thumb at 50 per cent, and in most instances total incapacity for general lines of work.

Conservative efforts are usually rewarded by satisfactory results, and the extent of operative measures is to be determined upon conditions present, and no absolute rule is acceptable. The repair in some of these cases is remarkable, and the improvised flaps, fashioned from fragments of tissue, are of much value in the functional result obtained. Quite a portion of bone may be removed and in the thumb the entire proximal phalanx resected and give practical utility to the member. Nails, almost entirely torn free, may be returned and reunite, and the slow process of granulation caused to cover over the exposed end of one-half the distal phalanx.

Amputation at the joint is the method of choice in most instances, and the suture of the ends of the extensor—to the flexor tendons, over the exposed end of the bone, is a most favorable aid toward giving a comfortable stump, and hastens repair in case of slough of the skin or suppuration.

Silk-worm gut is the material of choice for tension and superficial suture. Drainage by a wick of gauze, or a few strands of thread, should be maintained. After the closure of the wound, and prior to the application of the dressing, the unbroken skin surface to be enclosed should be covered with an ointment (of which the zinc oxid is a good example), which will greatly facilitate the subsequent removal of the dressings, and for the first three or four days after injury plain sterile gauze, held in place by a bandage of suitable width, secured by a strip of adhesive plaster, is sufficient.

Care should be exercised that the bandages are not applied too tight and obstruct return circulation, and if the hand is kept well elevated the subsequent hemorrhage and pain is slight. Soiled dressings should be removed every day and the first appearance of infection demands the removal of a sufficient number of sutures to allow free drainage and thorough irrigation. Support by means of a splint, to arrest the movements of injured tendons, will limit the extension of infection. Separation of slough and healthy granulation is encouraged by application of moist dressings. Indolent marginal growth, covering a zone of degenerated granulation, will take on a healthy aspect after the application of a dressing wet with a saturated solution of picric acid, covered with oiled silk or paper to exclude the air for twenty-four hours, followed by a thorough removal of the macerated epidermis by irrigation with hot normal salt solution, and subsequent daily application of a solution of 4 per cent picric acid and ¼ per cent formalin, which has been found so satisfactory in promoting epidermization, forming a pliable cicatrix.

Systemic conditions demand attention, and anti-malarial or anti-syphilitic treatment is frequently required. The favorable response to the administration of protoiodid of mercury to the colored race is eminently satisfactory.

DISCUSSION.

Dr. J. L. Crook, Jackson, Tenn.: I have listened with much interest to the reading of the Doctor's practical paper. Conservatism in the treatment of crushing injuries undoubtedly finds its best field for practical employment in the treatment of crushed hands and fingers. The surgeon is without doubt justified in taking greater chances with a crushed hand than with any other portion of the body. The beautiful anastomosis shown in the two arches, the superficial and deep arch, and their numerous branches, makes it almost impossible to have sloughing where you have a considerable portion of skin left providing your technic is correct and you are sure of the aseptic condition.

The main points in the Doctor's paper in regard to saving all the tissues possible, his treatment, etc., I should agree with in toto except for this one thing: He says that in all of these cases we should use general anesthesia, chloroform by preference. I cannot see any reason in the world for such a statement or such practice as that. I do not believe in giving chloroform or ether, I do not believe I ever gave either of these but once in the treatment of a hand condition, unless the entire hand was involved—I have certainly never given it simply to deal with the fingers. The essayist makes no distinction, hence I suppose he means that in any case, whether all or a portion is involved, he uses general anesthesia. In

the very next statement made he says it is difficult to get a competent person to give the anesthetic and that is one reason we should not use it in minor injuries. When a patient presents, with fingers crushed particularly, I frequently have no assistant present and do not require any in such cases. After going through the proper routine for getting ready for the operation, all that is necessary is to put a small rubber band around the base of each finger and use 1-5 per cent solution of cocain, there is no necessity for stronger solutions, in fact I believe their use has been discontinued by the best men all over the country. The 1-5 of one per cent solution gives the same results as those formerly secured by 2 and 4 per cent, hence I believe the stronger solutions should be absolutely discontinued. In the use of the lower percentage there is no possibility of getting a bad effect from the cocain.

You get to work immediately, and the patient being conscious, sees that you are using all possible means to save all the member possible. The best impression you can make is to tell him right at the start, "I am not going to mutilate you; my object is to save every portion of your hand that can possibly be saved; I will not sacrifice one single bit that remains, if the tissue is still there we will save it." The patient will give his consent to the operation under these circumstances, and is perfectly willing to have any portion amputated that is impossible to be saved.

This is another reason why we should use local anesthesia—the patient is ready to consent to what you do, but the most important reason is this: We should not subject any patient to the administration of a general anesthetic unless we cannot get along with local anesthesia, on the general principle that we wish to eliminate every possible danger from the operation. If a man dies from chloroform administered by an incompetent anesthetizer for an amputation of fingers, he is just as dead as though he had died from strangulated hernia.

So we do not care to run any risks with our patients for minor injuries. This was the point in the paper I wished to emphasize. The paper on the whole is eminently practical and I enjoyed it.

Dr. A. G. Servoss, Havana, Ill.: This being my first attendance at a meeting of this Association, I have felt a backwardness about speaking, not because there was not plenty to say or that I am not willing to say it, but simply because of the timidity a man naturally feels when he enters a new society. I want to compliment the Association, Mr. President, on a number of things before I enter upon the discussion of this paper. One of them is the eminently practical and thorough manner in which these papers are brought out and prepared. I expected to hear more about abdominal surgery and the amputation of limbs and other operations we do not often meet, than to hear, for instance, the discussion of injuries of the hand or of the fingers which we all as railway surgeons frequently meet, to hear the discussion which we had yesterday on injuries of the foot, followed or not followed by tetanus. I feel that I have landed amongst men who are discussing things I see every day and which I am anxious to know about, and so I believe this to be really the best society I have yet entered.

Coming down to the subject of this paper, I would say that heretofore my course has been to use general anesthesia in nearly all of these cases. It does away with a great many of the objectionable features of local anesthesia, and so far as I am concerned I have not been able to get the results from local anesthesia which have been described by the speaker immediately preceding me. I, of course, get the consent of the patient for what I think is necessary, then the anesthetic is given after the other necessary preparations are made. However, if it can be shown that local anesthesia is just as good as general anesthesia in these cases, I am perfectly willing to adopt it.

Dr. E. S. McDonald, Cameron, Mo.: There are one or two points I would like to mention in connection with the paper under discussion. The question of complete anesthesia for minor surgical operations. Gentlemen, when during the last 25 years I have administered chloroform it has been done with fear and trembling. Only a day or two ago a lad of 15 was taken from a neighboring town to St. Louis to be operated on for what seemed to be a minor surgical operation—adenoids occluding the nares—and

he was brought back in a coffin, an only child—the saddest family group that I have seen for many years.

I have never given a general anesthetic for any operation on the hand. I have amputated the fingers and parts of the hand, and if done immediately after the injury the part is already benumbed and anesthetized by the compression and the shock to the nerves supplying the tissues, and I have been able in nearly every other case of minor surgical operation on the hand to get along without giving chloroform. One thing that impressed me was the statement made by one of the gentlemen that he had never had any pus in his wounds. That is a remarkable thing, most fortunate I should say. I do not expect to have it, but I am not surprised when occasionally I do see it.

I disinfect and go ahead and treat the case without administering any anesthetic below amputations of the wrist.

Dr. E. W. Haradon, Jesup, Iowa: I have no fear of chloroform as an anesthetic under ordinary conditions, but for minor surgery I very seldom use general anesthesia. My son was with me at one time, and he said I had a habit of jollying the patient so that he did not realize the pain he was suffering. I find that by attracting the attention of patients a great deal of surgery of a minor nature can be done without the patient actually suffering to any great extent. This subject of injury to the hand reminds me of what we at one time heard from Dr. Peck, chief surgeon of the Rock Island, in regard to what the medical student prepared for when he left college; he ordered surgical instruments for major operations, such as laparotomy, etc. When probably the first case he would get would be that of cinder in the eye, and perhaps the next a crushed finger.

In 20 years' practice I have found crushed fingers very frequent, and I have never amputated a finger or removed even a part of it unless the bone was protruding. Of course in that case it is absolutely necessary to amputate the bone. I find that by treating it as an open wound, no matter how badly soiled the fingers may be, disinfecting it as thoroughly as possible by washing with sterile water or hydrogen peroxid in some cases, and dressing it with attention to thorough asepsis, applying moderate pressure at first, afterward applying the bandage firmly enough to round the finger into shape, there are almost uniformly good results.

To illustrate—I had a case of a man struck on the index finger with a 16 pound sledge, receiving the full force of the blow while driving a fence post. I followed the plan just outlined and gave the man a good, practical finger. A very small fragment of bone was removed. I rounded the finger up by pressure, and he has a serviceable finger, the first joint only having been lost.

As one gentleman has suggested, we are entitled to take a little extra chance in these cases to save them, and by adopting the open method of treating the wound I have never had any serious trouble from it.

Dr. G. F. Beasley, Lafayette, Ind.: I want to shake hands with the Doctor who gives an anesthetic in those so-called minor injuries. I have seen a great many badly mashed fingers, and when it is claimed that an amputation can be made through the hand by local anesthesia or by simply "jollying" the patient, practically it cannot be done. Where I do not have an anesthetist I give ether. I have in some cases picked out a good, level-headed fellow, started the administration myself, then let him take it up and I have gone on with the operation.

It was stated by Dr. McDonald that one gentleman claimed never to have had pus in a wound. As I remember, the Doctor was simply referring to pus in the particular amputation he was describing, not in other operations. Wherever tissue is dead, we are going to have some pus.

I have tried the use of cocain, and I have seen other men use it, but in my opinion if you want to do the work right in these cases you have to administer a general anesthetic. I tell the patient I will treat his hand just as I would if it were that of my own brother; that I may or may not have to take off some of the fingers, but if he does not want me to use my own judgment in the matter he will have to get somebody else to do the work. Under a local anesthetic you have a man shaking because he thinks you are going to hurt him, conse-

quently you cannot, as a rule, do the operation as thoroughly as under a general anesthetic.

Dr. Hugh Jenkins, Preston, Iowa: In minor injuries, by the use of cocain I have found it quite easy to abolish in large measure the pain, but in order to do good work it is necessary to have movement and trembling of the tendon also abolished, and that I have found cannot well be done by the application of cocain. Therefore in injuries of that nature I would favor general anesthesia. As the discussion seems to have turned on the lines of general anesthesia, I would refer to the combination known as somnoform. I have used this in quite a number of cases, and where an anesthetic is needed for only a comparatively short time it answers very nicely indeed, and the element of risk of death is very, very small. Among a large number, reaching into the hundreds of thousands, of administration of this agent, more particularly in dental practice, but also extending into surgical practice, there have been reported only 2 deaths, and of these, postmortem examination showed this result was not, in one of them at least, due to the action of the anesthetic.

Dr. C. B. Brown, Sycamore, Ill.: There is no one thing in the practice of surgery that fills me with so much fear as does the putting of a man under the influence of a general anesthetic for surgical operation. When we do, we are leading the patient to the edge of a precipice, and we do not know when he is going to step off, I do not care whether you have an experienced anesthetist or not.

Speaking of an experienced man to give the anesthetic, how are we who live in the country to get one? We have to take whoever is at hand, or we have to give it ourselves or pass it over to some one who perhaps is incompetent. I do not believe myself, and I think others feel the same, that I would let any of you fellows do much surgery on my hand without a general anesthetic, but when we operate on the other fellow it is a different proposition. I believe that cocain can be used very largely in this minor surgical work, and you can do another little thing that I have done in minor surgery: Use the cocain, and if the patient is very nervous let him inhale a little chloroform while you are working. This will help him a whole lot.

As regards amputation of fingers at the joints, I do not believe that it is good practice. I have had to re-amputate fingers which have been amputated at the joints, on account of a very bad "nub" on the end of it.

Dr. W. H. Condit, Minneapolis: We listened yesterday to the reading of a paper on the subject of procrastination, which started out by defining the different classes of people with whom we have to deal, and it brought out this point: Every case we have to deal with in our work is a law unto itself. I do not believe our brother here meant to say that he could do every single case that requires surgical work, under the influence of a local anesthetic. I have had it done, and I know what it means to have an operation performed under local anesthesia. Probably a number of you have done major operations under local anesthesia, but there are cases, for instance, a nervous Jew or Hungarian, liable to die of fright if we use simply local anesthesia. On the other hand, I have done 3 herniotomies under local anesthesia—strong, husky men, accustomed to enduring pain and hardship.

One other point, brought out in the discussion, I think ought to be criticized. I know of a surgeon for the Rock Island road and standing high in the profession, who, like our associate here, was alone in the office; he had a slight injury of the finger to treat for an employe of the company, he took a clean handkerchief from his pocket, put a few drops of chloroform on it and administered it, turned away, in a moment turned back again and found his patient was dead. This cost the Rock Island Company $6,500.

We know that these hand and foot injuries are very prone to occur among the laboring class, in shops, factories, and ordinary teamsters, and nowadays even the poorest working man is in most cases protected with insurance. Often the case comes to court, and more frequently still it comes to criticism. They pay a little insurance premium and they think they must have the best there is. If you hurt them a little in your office to start with they will

forget it tomorrow, and I agree with the sentiment expressed here that in the majority of cases we are far safer in using a local anesthetic. If there is free hemorrhage you will have difficulty in getting the action, but it is very easy to trace the nerve. You do not need to use cocain, but saline solution, go above the injury and inject a little of that about the nerve, put a little pressure on the nerve and you can do anything you want to on the hand. You can go as far as the median nerve and do that, or below it.

It is the same with hernial operations locally. To operate on a certain German patient, I gave him only two drinks of whisky and he swore he had no pain except when I tied the sac. The dissection is absolutely painless when you inject into the nerve sheath, and you can do that in the case of the hand just as easily; there may be exceptions, but, I repeat, every case is a law unto itself. I do not care whether the injury is of the hand or of the abdomen, there are no two injuries or individuals exactly alike. When necessary to use a general anesthetic I do not use chloroform—I feel safer with ether.

Dr. F. T. Fort, Louisville, Ky.: I have enjoyed this discussion very much. I have seen from some authority where a man was supposed to be nearer dead under natural sleep than when awake, and he is a great deal nearer dead when under the influence of a general anesthetic. I rarely use chloroform for the reason that some of our doctors have had such bad results from it. Most of us have cut chloroform out and use ether.

In regard to the treatment of injured fingers, I have treated several hundred of these cases and I cannot recall more than 3 or 4 where I have used a general anesthetic. I coincide with the Doctor who preceded me in his statement of conservatism and as to treating each case individually. I believe if we will bear that in mind we will get good results universally. While some neurotic patients require something to put them to sleep, in these cases I would use somnoform or ether, as I believe chloroform is liable to work more disaster in an extremely nervous person than will either of the others.

In my opinion, the indiscriminate use of cocain will not bring results unless a man makes a study of the introduction of it. The man who uses it haphazard will not get the results he would get were he to employ it in what we might term a scientific manner, carrying it around near the margin of the tissues that is to be removed with the knife. You can use the smallest solutions, as Dr. Crook says, and get partial anesthesia, it may not be complete, but, as has been remarked here, there is a great deal in "jollying" while employing local anesthesia. Another thing that helps a great deal, I think, and that is the application of very hot (not moderately hot, but as hot as you can bear your hand in) saline solution. There seems to be an anesthetic property to extremely hot saline solution.

The fingers specially deserve all the conservatism possible and to have left as much of the bone and of the member as possible. Many, many times, by simply dissecting back and nipping off the bone with bone forceps, laying the stump over and applying proper dressing, I have saved nearly all the finger.

As the essayist says, I never use ointments at all. My first dressing is composed of sterilized gauze with gutta percha to prevent sticking. I think a gutta percha dressing is one of the best things to incorporate over the end of the finger when recently dressed. Of course, it produces a bleaching of the epidermis farther back on the fingers, but in three or four days you can leave it off and usually the anastomosis is so nice, and, where there is not a complete loss of circulation, restoration occurs so quickly, that one is surprised, when in the beginning there apparently was no hope.

In regard to anesthesia, I often put it to the family when they want a general anesthetic administered. I recall a case that came to me two weeks ago. I did not think the man needed an anesthetic, his wife insisted he should have one before we attempted to do anything. My assistant was with me and we both agreed he did not need an anesthetic, and I put it to himself and wife in this manner: "There is some little danger from an anesthetic, but if you and your wife want to be responsible for anything that might happen from its administration, we

will give it, we will not assume any responsibility along that line—it is up to you to decide." His wife declined to allow a general anesthetic to be given, stating that if anything happened she would never forgive herself. The patient got along nicely without it and is well now.

Dr. D. W. Beattie, Neligh, Neb.: I am glad to see so thorough a discussion of so important a paper. We have injuries of the hand many times where we have thigh amputation once, and the hand is one of the most important, if not the most important, member of the body, especially to a laboring man.

What shall be done in a case of injury to the hand? Let me say to begin with that there is probably no portion of the body where the reparative process is any more active than it is in the hand; it is even more so than in the foot, and, in dressing the hand, be very careful about even thinking of amputation. Of course, there are cases where the necessity of amputation is evident at once, but you will be surprised if you will treat these cases with care how some cases that look as though absolutely hopeless, how some fingers that look as though they must be sacrificed, can be saved; and I have even done this sometimes when I have been in doubt —I have dressed a finger and then waited until nature gave me a line of demarkation showing me that the finger had to be sacrificed.

In treating these cases, I always use a wet dressing, not bichlorid of mercury because in the presence of blood bichlorid of mercury quickly becomes inert, there is an albuminate of mercury formed which is absolutely useless as an antiseptic. I use about 1 per cent solution of lysol, but other things are used with as good result. I sometimes use a solution of lysol with glycerin because it does not stick to the tissues. I never use a dry dressing on a wound where I wish to have drainage; I always use a wet dressing and cover with rubber tissue or dressing paper.

In regard to anesthesia, you will pardon me when I say that to entrust the administration of a general anesthetic to some one who does not understand it, ought to be considered criminal. I have had druggists say to me, "I have given a general anesthetic many times and will help you out when you need some one," but I have invariably replied, "Not me." I told Dr. Murphy that one of the great troubles in doing work in the country is to find some one competent to give a general anesthetic properly. "That is the trouble right here in Chicago," he replied.

As to whether or not a general anesthetic should be given, I would rather hurt a man some than to take any chances on the dangers incident thereto.

I wish to say one word about fractures of the hand. A fracture of one or two fingers can be easily taken care of. We can use one finger as a splint, binding a fractured finger to it; but in fracture of the metacarpal bones it is possible for you to come against a condition which will be exceedingly embarrassing to you at the time, and to yourself and the patient afterward. I refer to a condition where the hand is caught in machinery by some means or other and placed in extreme extension until the metacarpal bones are broken. They may be broken and the hand extended until the soft tissues will pop open across the palm. So we have not only broken bones to treat, but a lacerated wound of the palm that must have attention. The proper way to dress the hand in order to take care of the broken metacarpal bones is in extreme flexion with pressure in the palm, the proper way to take care of the lacerated palm is with the hand open so that you can take care of the wound. It may seem easy, but when you are right against the proposition it may not seem so easy. If you dress the hand straight I can assure you that the lower fragments of the metacarpal bones will be tilted into the palm at an angle of at least 45 degrees. If you go in and wire the bones in all probability the wound will be infected in spite of all you can do. You say that this ought not to be, but they do become infected and pus forms. What are you going to do? If you wire the bones together at this time you will be sorry you did so, because the wound will continue to suppurate. There seems to be only one thing to do: Take care of the wound first, and later go in from the back of the hand and wire the bones together. I have recently been watching a case which Dr. Murphy treated in this way. So in fracture of

the metacarpal bones, recollect that you may have a condition that is very embarrassing.

Dr. J. R. Hollowbush, Rock Island, Ill.: The gentleman from Minneapolis has expressed my views on the question of anesthesia. As the Doctor says, each case is a law unto itself, and we have to use our own judgment in the selection of an anesthetic, or whether or not one shall be used. In the selection of a local anesthetic, the key to the situation is whether or not you can control the circulation. In operations upon the feet or hands or any portion of the body where you can control the circulation by a rubber ligature, you can use cocain with perfect safety. You can gradually loosen the ligature and have the circulation wash out the cocain left in the tissue. If you are going to use a local anesthetic where you cannot control the circulation, why not use Schleich's mixture, which contains very little cocain, and by thoroughly infiltrating the tissues, making them tense, you can operate just as well as with cocain, without danger, and get the same amount of anesthesia.

As to surgery of the hands and feet, I read a paper some years ago on "True Conservatism in Amputation of Hands and Feet," and I still stand in the same position I took then with reference to this subject, and that is that *true* conservatism, especially as to the hand, is not to save all the parts you may be be able to save, but only those which will conserve the usefulness of the member. What is the use of saving the stump of a finger, or a finger stiff and cold and the flesh attenuated? It is always in the way and useless. Sacrifice all those parts which are not going to be useful to the man after the operation is over. True conservatism in operation on the hand and foot consists in returning that man to his home a good worker and useful member of society, regardless of the amount sacrificed. In amputation of a finger it is better to remove the head of the metacarpal bone than to leave it. By going back farther you sacrifice more tissue, but the man is a more useful member of society.

Dr. Hugo Philler, Waukesha, Wis.: Many years ago in this city some of us were present at a clinic given by Dr. Senn when he performed the operation of resection of the lower jaw for a large sarcoma without an anesthetic. Those of you who were there remember that he took a common carpenter's chisel and mallet and made little strokes on the bone and showed us the resected part, and you will remember the remark he made: "Gentlemen, fortify your patients before any operation, do not fortify yourselves; give your patient a liberal amount of alcohol and general anesthesia is unnecessary and unwarranted in operations in the region of mouth or throat."

Dr. H. Reineking, Milwaukee, Wis.: The question of anesthesia was not brought out in the paper particularly, but as it has come up for such extended discussion I wish to say a word regarding it.

There are cases which require general anesthesia, we cannot deny that, and when it comes to amputation of part of the hand we require general anesthesia, and the question is, which shall it be? We all know that there is a great deal more danger in administering chloroform than ether, we cannot get away from that fact. You may have only 1 death in 10,000 chloroform anesthesias, but that one patient (the same simile has been used here before) is just as dead as though it was the twenty-fifth case. But death directly due to chloroform is not the only danger; this is minimized by having an experienced anesthetist, but there is the danger of acute fatty degeneration.

Within the last six months I had a case in which chloroform was administered by a man in whom I had implicit faith. Within four days that patient died from intoxication produced by acetone and acetic acid due to fatty degeneration brought about by chloroform. You have no doubt noticed how ether has grown in favor in other countries. At the present time I believe we should take up the more modern anesthetics, some of which have been mentioned here, and among these ethyl chlorid. Under its influence the patient goes to sleep almost immediately—the time required for its administration can almost be measured by seconds—and the effect is sufficiently long to do almost any operation upon the hand. There is now being tried in my city a suit for malpractice on account of death from chloroform administered for a little work upon a single finger. The man

could have stood that operation without an anesthetic. The Doctor has not used chloroform all told more than 50 times, and he is now sued for malpractice. Ether is certainly safer, but in the minor cases I think we should give more attention to ethyl chlorid and the more recent anesthetics which have not been mentioned here.

Dr. E. J. Waddey, Waterloo, Iowa: It hardly seems possible that some of our members who have in discussing the paper confined themselves to one idea in connection with a subject like this, could have intended it that way. I do not think any one believes, although one or two of the gentlemen seem to have placed themselves in that position, that all cases require general anesthesia, or that all cases can get along with local anesthesia. They certainly ought to belong to the "middle of the road" men, treating each case individually and relying on their own judgment as to whether or not a particular patient can endure pain to a degree which will enable us to accomplish what we have to do in the way of repair work.

The essayist made one statement in regard to nails growing again which surprised me a little, because whenever the matrix is torn loose I believe we always get a new nail—that has been my experience.

Every detail in the administration of a general anesthetic ought always to be followed by us as though the case before us might be the one which would die on our hands. I have always felt that way ever since I have been practising medicine, whether I was giving the anesthetic for somebody else or somebody else was giving it for me. We should get along with the very least amount of the anesthetic possible and still do our work without distress to the patient.

One point that has not been touched on by any one who has been on the floor and which I think quite important, especially in the case of men who have to earn their daily bread for themselves and families, and that is those minor injuries that cut clean through the body of the skin. A great many of these are considered so slight that the surgeon oftentimes does not think it necessary to clean up thoroughly, he does not put a stitch in them. If over a joint he gets a wound that has to heal by granulation and it is liable to become septic and cause the man to go around for two months with the hand in a sling, the infection may travel up the arm and the case become more or less complicated. Any wound that is clean through the skin and gapes, or is over a joint whether clean through the skin or two-thirds through the body of the skin, ought to have one or two stitches in it, enough to close it, after it has been thoroughly cleansed, and the cleansing of these wounds about the hand depends largely on how well we probe them to get out the dirt that has been ground into them, and unless you do a little grinding equivalent to the grinding that was done when the dirt was forced into the wound you will have infection either by bacteria or by the death of the injured tissue.

Dr. Baldwin (closing): In reply to this generous discussion, which I assure you must be accepted by me as a compliment, first as to anesthesia: I hesitate to offer any figures upon the subject, but my impression is that only about 4 per cent of hand cases require an anesthetic, and in those cases a general anesthetic is to be preferred. An experienced anesthetist is not always to be had, but one familiar with the dangers incident to general anesthesia may be, and while the injured member is in the process of disinfection and being made ready for operation, we may seek and secure, if possible,, the services of such a man. A general anesthetic is the only satisfactory method of operating on severe cases.

One word on the general anesthesia which can be produced by the hypodermic method; this has not received that endorsement which would enable me to speak on the subject. I have used it in some cases with satisfaction, in others without satisfaction. Following the administration of hyoscin, morphin and cactin, many of these cases develop a condition of hallucination that is troublesome. The class of patients with which we have to deal in railway work do not stand for very many suggestive therapeutics, it is hard enough to get them to understand plain facts.

As to partial anesthesia, we are advised that greater danger comes from partial than from profound anesthesia.

As regards the selection of the method of

amputation through or near the joint; if during this process the infection extends to the medullary canal, we know that phalanx is lost, and for this reason it has been my preference to select the joint at the expense of the skin portion of the flap. If the subcutaneous portion can be made to cover the joint surface, granulation will come. In cases that have had amputation, one at the joint and one above, it has been found that the joint amputation leaves a more serviceable member. I would discourage amputation of the proximal phalanx of the index finger between the joints; but rather than resect the proximal phalanx of the middle finger I would give the preference to a median amputation that will afford that key-stone.

One word about resection of the head of the metacarpal bone; it breaks down that arch, it removes the key-stone, and the hand has been robbed of a great deal of its usefulness. And while we must perhaps in the case of those in the higher walks of life take into consideration the cosmetic effect, this is not so essential in the case of a working man.

PELVIC INJURIES.*

W. H. CONDIT, M. D., MINNEAPOLIS, MINN.

There are few subjects, peculiar to the special department of medicine and surgery, in which this Association is interested, whatever the title with which they may have been honored, that have not at some time been before us for discussion. However, no one subject is so *old* or so *new*, but that a timely discussion may be instructive individually and collectively.

One is prone to select rare or mysterious cases for study, because of their novel interest, and neglect the more frequent and important conditions arising in the hazardous calling of railway operating. Perhaps it was the novelty of two recent cases, which fell into my charge, that suggested to me the subject of pelvic injuries, but it will surely bring before us an important class of injuries, always interesting. We know a severe injury to the pelvic frame is classically characterized by complications, and usually serious ones are attendant thereon.

Any review of the pelvic anatomy and related structures is quite unnecessary as it is simple and gross, hence familiar to all. We know the bony structure itself is quite elastic; this quality being much increased by ligaments and fibrous disks uniting the various sections. The powerful muscles about the pelvic frame furnish exceptional protection, hence the force necessary to produce injury must be very great. Age is an important factor entering into the study of the gravity and extent of injuries to this part of the body; the elasticity in the young being much greater than in later years, and ofttimes in young people the soft parts surrounding the pelvis may sustain extensive injuries, especially in the region of the pubes and in the gluteal region, without there being any real bony lesion.

Injuries of the pelvis in times of peace are not common and undoubtedly a greater number occur among railway operators than in any other calling, unless it be among mine and tunnel workers. Golebiewski found 1 fracture of the pelvis in 3,972 injuries, i. e., .025 per cent, there was 1 contusion and 3 other injuries. Of 9,100 injuries tabulated elsewhere, there were 5 fractures, *i. e.*, .05 per cent. Only 3 per cent of all fractures affect the pelvis. "Figures never lie," but numerical statistics must be considered with question marks.

The different classes of injuries to which the pelvis may be subjected are the same as may be met with in any bony structure of the body, namely from mild contusions to fatal fractures; the latter, when the pelvic frame is involved, naturally means the loss of the life of the individual, where otherwise it would be only loss of the member. The *extent* of injury which may result is dependent upon so many factors that it is an impossibility to measure the violence or force in foot-pounds necessary to produce a given fracture resulting in a definite, proportionally serious injury.

Rose reports the case of an old woman who

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suffered a fracture of the pelvis following a slight fall on the hip, the patient dying of secondary purulent peritonitis. One case herein reported would be classed as the other extreme, where a man with a transverse measurement from crest to crest, of 14 inches was rolled in a 9 inch space, escaping with slight injury.

I will not attempt to review the mechanics of pelvic fractures. It would be too tedious as well as impracticable since the forces are so *varied,* and the resultants so atypical and often so multiple. The *typical* situations for a fracture of the anterior ring of the pelvis are the places where the bones are thinnest and where these portions unite with the thicker parts, or where the various sections of the bone during youth are united by cartilage.

We have two distinct classes:

1. Those which involve the pelvic girdle as a whole.
   - A. Separation of the symphysis pubis.
   - B. Fractures of the horizontal and ascending rami of the pubis.
   - C. Vertical (single or double) fractures of the lateral portions, *e. g.,* the ilium passing through the acetabulum.
2. Those which involve individual bones.
   - A. Fractures of the expanded upper portion of the ilium.
   - B. Fracture of the rim of the acetabulum.
   - C. Fractures of the ischium, sacrum and coccyx.

Of the above the most common are those in which the rami of the pubis or the alæ of the ilium are broken. The remaining ones are very rare.

The history of one case which fell into my care is as follows: Mr. Jas. L., yard master of Rock Island R. R., age 33, height 5 ft. 9½ in., weight 155 lbs. Past history negative except for a mild case of typhoid pneumonia followed by appendicitis, with operation two years ago. On August 2d, 1907, patient was caught between a moving freight car and the wall of the freight house, being rolled around in an upright position in a space of about 9 inches in width. Patient's measurement from left acromion to right, transversely, is 16 inches; from crest to crest of pelvis 14 inches. The shoulder transverse line can be very easily shortened because of the elasticity and mobility of the thorax and shoulders, but the pelvis has no such possibilities without some damage resulting.

When first visited about two hours after the accident, patient was in slight shock, suffering from intense pain in the lower lumbar and left ischial region, tenderness over sacro-iliac joint and dislocation of the left clavicle from acromial attachment; he considered shoulder injury so trivial compared with the pelvic injury that it was not worth considering. There was free hemorrhage from the urethra, but no evidence of external violence to the perineum, and later ecchymosis was confined entirely to the scrotum. There was a slight skin abrasion over left trochanter and right crest of ilium, the points of contact in his rolling through the space.

The dislocation of the clavicle was caused by the acromio-humeral joint being forced toward the center of the body, tearing it loose from the ligamentous attachments; later extreme ecchymosis appeared about left shoulder and arm. (I wish here to refer you to a very interesting article by Dr. R. L. Murdy of Aberdeen, S. D., on the subject of acromio-clavicular dislocations, read in this city before the 14th annual meeting of the C. M. & St. P. Surgical Association and published in the September, 1907, number of the RAILWAY SURGICAL JOURNAL.)

Patient was sent to hospital ad confined to the bed on his back. He was able to void urine at all times without assistance and the blood in the urine disappeared on the 5th day. I have been unable to satisfy myself on the etiology of the urethral injury. I am positive there was no fracture of either ramus, at least not enough to cause any fragmentary displacement. Patient carried a large knife in his pocket and he may have been thrown against a corner jamming the knife or corner against the perineum. On the 3d day patient's temperature arose to 100° and he complained of pain deep in the left iliac region; a mass the size of a goose egg was evident on percussion and extremely tender on palpation. His temperature gradually rising reached 102° on the 7th day,

then gradually declined, the mass disappearing. On the 14th day patient was normal.

I considered that extra-peritoneal hemorrhage was responsible for the mass and the temperature due to a possible colon infection of the hematoma. Two leucocyte counts while the temperature was highest gave 14,200 and 13,820 respectively, the count giving but 9,100 after the temperature subsided. Patient has made an eventful recovery with no complications except slight urinary disturbance from the injury in the posterior urethra which has twice been relieved by sounding. He says the shoulder is as good as ever; it is now 9 weeks since the injury.

The second case I wish to report is the case of J. S., laborer in a lumber yard. On November 3d, 1906, he was caught between bumpers of two small cars, sustaining a fracture of the crest and ramus of left side, complicated by complete severing of the urethral canal. Urethra was drained via catheter in perineum for 4 weeks when the severed ends were united and patient was at his work in 3 months and except for some trouble with an urethral stricture, which is a natural consequent, he is completely well.

For *diagnostic* purposes we have but two points to determine:

1. Is the fracture or injury accompaied by visceral injuries?

2. Is the injury *not* so complicated?

The possibility of a fracture of the pelvis with or without visceral complications must always be thought of in examining a patient who has been subjected to a crushing force, such as being run over, caught between buffers, or in falls from a height, especially upon the perineum with the limbs apart. In more severe cases there is usually considerable pain and shock at the time of the injury. In less severe forms the pain and shock are often so slight that the fracture is either overlooked, or there are no symptoms until the patient attempts to get up.

In fractures involving the alæ or crest of the ilium, pressure on both crests, either toward or away from the body axis, may elicit crepitus or pain in the sacro-iliac joint; of course, great care must be exercised where severe fracture is anticipated, lest we displace fractured fragments. In fractures of the pubic or ischial rami, as well as in deep-seated ones of the ilium, pressure backward on the anterior spines will cause pain. A rectal examination should never be omitted. The x-ray is of little aid.

The *complications* of pelvic fractures and injuries are numerous, *e. g.*, wounds of the overlying skin and muscles; lacerations of adjacent nerves and blood vessels; internal and extra-peritoneal hemorrhages; aneurisms of pelvic vessels; injury to rectum or vagina; rupture of urethra, bladder or intestines.

In addition, because of the gravity of these accidents, we must not overlook serious injuries to other abdominal or thoracic viscera, spine, skull and brain. Bryant has reported three cases of thrombosis of the external iliac artery, and there is always danger of pulmonary embolism due to a thrombus from one of the larger pelvic veins. The bladder is less often injured than the urethra. A rupture of the bladder is usually of the intra-peritoneal variety, due to displaced fragments or penetration by a splinter of bone. The most difficult point is in determining a rupture of the bladder *early,* before any signs of peritonitis is evident. I believe the test of filling the bladder with a measured quantity of sterile water is not only likely to erroneous conclusions but a dangerous procedure, as the pressure might make a complete rent in the wall where only a partial one exists.

If attention be acute the first 24 hours on the urinary symptoms, *e. g.*, difficulty in urination, retention and hematuria especially—a correct diagnosis is very possible. Paralysis of the bladder functions, as a direct result of nerve or muscle injury must not be overlooked. In extra-peritoneal tears of the bladder, besides symptoms of dysuria, retention and hematuria, we may have increasing area of dullness over pubis or signs of infiltration of skin and subcutaneous tissues.

Prognosis depends upon the immediate and remote results. Unless diagnosis is made at an early period, the prognosis of these injuries accompanied by visceral injury is very grave.

Fractures uncomplicated by visceral injury, are usually favorable as far as immediate results are concerned, and are quite recovered in 6 to 8 weeks. Fractures through the acetabulum are especially to be feared. Prognosis of fractures of the anterior-pelvis depends upon involvement of the urinary apparatus. If we escape sepsis or involvement of the obturator nerve we can feel pretty comfortable.

Treatment of pelvic injuries aims to overcome the shock, to replace fragments as much as possible; better to do too little than too much such manipulation. Keen says *no* effort should be made to reduce the fragments. The pelvis can be supported by a wide muslin bandage passed around it, the knees being fastened together. Fancy bandages, pillows, etc., are uncomfortable and useless. A water or air bed with sand bags to keep patient in position gives best results; with patient at absolute rest, under close observation, and the complications treated intelligently, one will be rewarded with best obtainable results.

To go into the detailed treatment of the many complications possible in pelvic injuries would require volumes, hence is not within the limits of this paper. I wish to remark on the exceptionally good recovery of the acromio-clavicular dislocation in the case here reported, made possible by the absolute necessity of the patient remaining in bed; usually such cases are ambulatory, hence difficult to preserve in apposition. I strapped his arm to his side, ran a wide adhesive strip from elbow over shoulder to vertebral column and another vertically over clavicle from anterior to posterior waist line. The patient has a good shoulder.

INJURIES INVOLVING THE BLADDER AND RECTUM.*

A. B. BOWEN, M. D., MAQUOKETA, IOWA.

Wounds of the bladder and rectum are somewhat infrequent, owing to their location as well as to their sheltered or protected position. With the sacrum posteriorly, the pubes in front, while the ischii and iliac bones laterally, it is shielded from flying missiles, punctures as well as crushing forces; but the distensibility of this organ enables it to rise out of its protecting wall of environment, the pelvis, and thus becomes more vulnerable to traumatic forces, to perforating missiles and crushing injuries.

I once saw a largely distended bladder ruptured during the operation of aspiration. As the needle was plunged through the hypogastric region into the bladder, the force of the operator's hand coming in contact with the tumefied abdomen caused the distended viscus to rupture and diffuse its contents into the peritoneal cavity, but the vulnerating missile may come from below, perforating the perineum, or sacro-sciatic foramen and inflicting injury on these organs from this source of invasion.

During the war of the Rebellion, a distinguished Federal officer while conducting a retreat under a heavy fire, was killed, but no mark of violence was found on his person, and the nature of his injury was involved in mystery till the body was embalmed and the bullet found imbedded in the lung, having entered the body through the anus and rectum. This source of invasion of the body has sometimes been resorted to by criminals "to hide their tracks" and elude detection, as in the case of Edward II of England, who was assassinated by ruffians, who introduced a hot iron through the anus and rectum into the peritoneum, a method as ingenious as barbarous.

Doubts may arise in the mind of the surgeon regarding the integrity of the organ, but the passage of a catheter or the distension of the organ with fluid, will usually clear up the mystery, for an empty bladder usually implies an artificial outlet. The wound will be extra, or intra-peritoneal, depending on its location above, or below the peritoneal reflection. If the wound is extra-peritoneal, emphysema of the cellular tissue will result, while if intra-peritoneal, the contents will be diffused into the peritoneal cavity.

The mortality from wounds of the urinary bladder whether intra or extra-peritoneal are grave.

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

In default of prompt surgical intervention, the extra-peritoneal wounds are followed by diffuse phlegmonous inflammation, abscess formation, sepsis and death in the great majority of cases; and intra-peritoneal wounds with few exceptions result in death from progressive septic peritonitis.*

Stephen Smith reports 2 recoveries out of 80 cases of intra-peritoneal rupture of the bladder without surgical intervention, but the extravasation of urine was doubtless small and the wound blocked by adhesions, the peritoneum might be equal to the task of eliminating its dangerous intruder.

F. H., a lad of 6 in his boyish pranks, placed a shingle on the sharp point of a rusty iron that served the purpose of a cut-off for a hydrant, and sat down upon it. His weight split the shingle and forced the iron into the rectum through the anus and into the bladder. No great amount of shock attended the injury, but the urine was voided through the rectum. The treatment consisted largely in position, keeping the patient in the prone position, maintaining the viscus in an empty condition, and disinfection of the tissues and organs involved. Recovery was speedy and perfect.

W. B., a large, strong farm hand, while sliding down a straw stack, his perineum came in contact with a pitch fork that was leaning against the stack. The end of the handle penetrated the ischio-rectal fossa of the right side and perforated the bowel. At the examination the finger passed into the wound met the finger passed into the rectum some 3 inches from the anus. The parts were douched, cleansed and disinfected, while suitable drainage was resorted to. The wound healed readily and the functions of the parts perfectly restored.

Mc., aged 17, a strong, healthy farmer, while sliding off a hay mow, collided with a pitch fork which was leaning against the hay. The end of the fork handle, about an inch and a half in diameter, entered the anus, passed up the rectum some 3 inches, perforated the anterior wall of the rectum and penetrated the bladder. The rent in the bladder wall was some 2 inches in diameter, posterior to the trigone in the base of the bladder, and between the ureters. Considerable shock and hemorrhage attended the injury. I saw the patient twenty hours after the accident. The great amount of laceration of tissue and contusion rendered its repair difficult. The urine had escaped through the rectum, while fecal matter had found its way into the bladder. After thorough douching, cleansing and disinfecting, the lacerated tissues were reached, after thorough stretching of the rectal sphincters and applying a Beebe's vaginal speculum, which facilitated the approximation and suture of the bladder wound. The rent in the rectal wall was closed in a similar manner. Silk sutures were used in both instances and their free ends left in the lumen of the rectum to facilitate their removal. A retention catheter was worn for ten days, also the bladder and rectum were douched daily with antiseptic solutions, including permanganate of potash. Urotropin was administered internally. The patient avoided the supine position in bed, but rather assumed the prone and lateral positions of the body. The patient emptied the bladder normally after two weeks. Recovery was perfect. After four weeks he left the hospital and commenced exercise. The functions of both injured organs are perfect. No cystitis or other untoward symptoms were present.

*Nicholas Senn.

PUNCTURE OF RECTAL WALL—REPORT OF A CASE.*

J. H. MILLER, M. D., PANA, ILL.

On Friday, September 13, 1907, I was called in consultation with Dr. J. M. Little of Rosemond, Ill., to see Mr. C. A. C., a farmer. The patient had gone into his hay loft, and while there his hired man had placed a pitchfork near the foot of the ladder, used in getting into and out of the loft. The patient had descended almost to the bottom of the ladder, then jumped onto a pile of hay in which the fork had been placed. As the hay gave way under his weight he came in contact with the

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

handle of the fork which struck him just to the left of the anus, tearing its way through the soft parts, rupturing the sphincter on the left side, passing into the rectum to the right, passing through the right rectal wall 4 inches above the anus and evidently being arrested by the bony wall of pelvis above. From an examination of the fork handle it could be readily determined that it had penetrated 5 inches. The handle measured 1¼ inches in diameter. There had been but little hemorrhage, not much pain and but little shock. The pulse was 96, temperature normal.

Digital examination as well as with a speculum revealed a horizontal slit in right rectal wall 4 inches above margin of anus. This slit was about 1¼ inches in length and when left alone, remained almost closed. The external wound and the sphincter were stitched after being cleansed. The internal wound was left alone and the rectum flushed once a day with an antiseptic solution. When a small quantity of fluid was used there would be no pain but if much was used there would be considerable pain felt over whole abdominal region. After one experience this trouble was avoided, by using only a small amount of fluid. This would be retained for some little time but would eventually come away slowly bringing with it some mucus and blood.

The temperature for the first eight days never went above 100° F., and only once to this point, this being on the evening of the second day. On the eighth day the temperature suddenly jumped to 103° F. and his tongue was covered with a white coating. Inasmuch as our patient had spent several days just prior to his injury on a trip down the Mississippi river this rise was attributed to malarial poisoning, and a liberal exhibition of quinin soon brought the temperature to normal again. During the third week the patient was allowed to walk about the yard and on the tenth of this month, twenty-seven days after the injury, he rode to town in his buggy, a distance of 6 miles and called at my office. He expressed himself as free from pain and feeling well.

DISCUSSION ON PAPER OF DRS. CONDIT, BOWEN AND MILLER.

Dr. J. D. Seba, Bland, Mo.: These papers strike me forcibly, because I have had some sad experience in my practice along this line.

The first case was a railroad case, that of a trespasser, who had lain down on the Rock Island depot platform and gone to sleep, and when the night flyer passed he was suddenly awakened, and running into the train as he was in a dazed condition he was picked up, thrown a distance of about 8 feet, and set down right upon the handle of an implement which had been used for tying ties, causing a laceration of the whole perineum. I was called to take care of the case. (He also had a fractured arm and leg.) I took in the situation and discharged him as a railroad surgeon and took care of him as the county physician, a position which I also occupied and kept the case until the patient died, not as a railroad case, but as a county charge. It was unfortunate for the young man that he lost his life and his relatives threatened to sue the company, but under the circumstances they had no case and damage suit did not follow.

Another case was not exactly mine, but it happened in my immediate neighborhood and I was called to see it. This case was identical with the one described by Dr. Miller. The man was sliding down a hay-stack and fell on a pitchfork handle. The other cases were more along the line of the first paper read, both fractures of the pelvis, fracture of the acetabulum, etc., all of which were tedious and hard to handle, and I was very much interested in the papers.

Dr. S. C. Glidden, Danville, Ill.: One point I wish to speak of in connection with pelvic injuries, and that is the use of the Bradford frame in treating cases of fractured pelvis. This is a gas-pipe frame about 4 inches longer than the patient and about 23 inches across; there is room enough for the patient to lie comfortably, and he is covered with an encasing of canvas divided into two parts. This frame should be made of gas pipe large enough to be perfectly rigid, and you will find it can be placed on the bed under the patient and he can

be lifted up with a great deal of ease, and in the use of the bed-pan or in any movement of the patient it is very convenient, or to arrange the bed he can be taken off and placed upon two chairs. In fact you will find it can be used with a great deal of facility.

Dr. K. W. Doege, Marshfield, Wis.: I wish to draw attention to the extensive and even dangerous hemorrhage that occasionally takes place in connection with pelvic injuries. And in order to do so, I will simply report a case which I had occasion to treat about one year ago.

A young man while riding on a logging train was wedged in between a box car and a log when a wreck took place, the log striking him cross-wise of the hips and throwing him forward on the ground. During this wedging the skin was torn loose to a large extent from the pelvis as well as from the abdominal wall, creating in that way a large, loose cavity. When I saw him, about 12 hours later, he had a pulse of 120, had not urinated and felt no desire to. On examining him he was tender over the pubic region, but not so much over the crest of the ilium. His pulse was very small and there was quite a large hematoma over the abdomen and peritoneal region. He wanted to see his parents before anything was done. Several hours elapsed before operative treatment was commenced. Four hours later his pulse had gone up to 140, and on explaining to him the danger of longer procrastination he consented to have something done. He was placed under an anesthetic, incision was made over the pubic region and a large amount of fluid blood evacuated. Another incision was made over the right ilium in order to get thorough drainage, then on examining through the incision it was found that the symphysis pubis was separated to the extent of about 1 inch. I pressed the pubis together, but approximation was only possible, leaving a gap of about ¼ or 1-3 inch. At the first examination he had been catheterized, but no urine could be obtained. The bleeding came entirely from the prevesical space, where the large and tortuous veins had been torn by the jagged, torn condition of the pubic. The condition of the patient became so severe during operative intervention, the pulse going up to 160, that we had to pack the wound and give thorough drainage. In order to be sure there was no laceration of the bladder, a small incision was made and the abdomen examined, which did not take but a moment, and there was no urine found in it. The wounds were packed and the next morning the patient complained of a great deal of pain and desire to urinate, and before my arrival he had a sudden, severe pain, and the urine began to trickle through the dressings in the suprapelvic region. It was evident a rupture of the urethra had taken place, and that the bladder was emptying itself through the wound. No change in dressing was made. The temperature and pulse had been quite satisfactory and the wound was simply dressed like any ordinary wound. The deep dressing was removed about a week later and the granulations were satisfactory, and about the end of the second week an attempt was made to find the real state of the urethral injury. The perineal incision was enlarged and it was found that the transverse urethra had been ruptured entire. The ends were found without great difficulty and the upper and anterior walls of the urethra were united by three separate catgut sutures and a permanent catheter passed through the urethra into the bladder. The subsequent history was of no special moment, as the case progressed favorably. The wiring of the separated symphysis was attempted, but this was not possible. So we contented ourselves with the application of a bandage, and I would say that later on he could walk miles and said he was just as strong as before.

The reason I relate this case is simply to draw attention to the fact that separation or fracture of the symphysis in pelvic injuries may be followed by very extensive subcutaneous injuries on account of the tearing loose of the skin from the abdominal wall and pelvis and allowing free extravasation into these parts from the bladder.

Dr. J. H. Stealy, Freeport, Ill.: A question that has arisen with me several times when called to see cases of this kind, is, what shall we do? Take a case, for instance, like Dr. Miller has described, where the fork-handle en-

ters the anus and passes through the anterior wall of the rectum and does not injure the bladder or any other organ so far as we know other than the anterior wall of the rectum; are we to operate, open the abdomen at once and find out the conditions, or are we to pursue an expectant course? Dr. Miller pursued an expectant course and his patient made a good recovery. I have heard doctors relate similar instances where patients recovered simply with the expectant treatment.

A year ago last August a doctor telephoned me in regard to a case of this character which had occurred about two weeks previous. The patient had developed considerable temperature and the doctor thought some peritonitis, but apparently was getting on very nicely, so I recommended the expectant treatment. In the course of three or four days or within a week, the doctor telephoned me to come and see the patient. I went up and examined the patient and found that he had a peritonitis of the lower half of the abdomen, and the pelvis showed upon examination through the rectum an opening which was discharging. I was able to reach that opening with my finger, however, I examined the parts with a speculum and could find no evidence of any pus, but there was an induration, and the patient was apparently getting better and I at that time advised leaving the patient alone, which was done. The patient after that apparently recovered, he was up and able to be around, but in a few days he was taken worse, developed a general peritonitis and died. Now, I have always regretted that the course in that case was one of procrastination. Had I seen the patient early I think I should have advised operation, but as I saw him first some eighteen days after receipt of the injury and the patient seemed to be doing well, I thought I would keep my hands off. But I do not know as I did right in that case.

Dr. A. G. Servoss, Havana, Ill.: I have had a little experience in this same line, and, as Dr. Stealy has asked the question, I desire to relate my experience as being similar to that of Dr. Miller. In this case the handle had entered some 4 or 5 inches, had torn the sphincter muscle quite a bit, and, while it had injured the anterior wall of the rectum somewhat, had not injured the bladder. We simply investigated carefully to see whether the bladder was injured, the water coming through the catheter showed clear and no trouble indicated, so we followed expectant treatment and had good results.

Dr. S. Bell, Beloit, Wis.: During a series of 44 years of active practice, I have seen 3 of these cases. In '64 a negro following our camp loaded himself with a lot of canteens, mounted a mule and started for a spring to get fresh water; but when he started back there was something doing, the canteens began to rattle and he was thrown, alighting upon a stump which had been cut off the day before, puncturing the posterior surface of the sphincter and entering the rectum about 5 inches. The wound was cleansed and united with horse-hair soaked in alcohol, and the case got along so that after three or four weeks the patient was about and doing his regular duties about the camp.

The second case was in '73; a farmer who had just finished topping his stack of grain, in attempting to descend without a ladder began to slip and fell upon the handle of a pitchfork which was leaning against the stack. It entered the rectum about 8 inches, lacerating the sphincters on both sides and the bladder, but he made a good recovery and is living today. The third case was that of a man feeding a threshing machine. Something happened to the carrier, he stepped from the feeder's table and was impaled upon a crowbar, which entered the rectum, I do not know how far. I was called four days afterward.

Dr. A. E. Genter, Sheboygan, Wis.: One point that does not, from the little experience I have had, coincide with my view in fracture of the pelvis, is that of shock. In every case (and it is only a few I have seen) I have had profound and prolonged shock. Another thing that I want to call attention to is the comfort the patient gets from the use of the water-bed in treating cases of fracture of the pelvis.

Dr. I. K. Gardner, New Hampton, Iowa: Some four or five years ago I reported at the St. Paul meeting held in this city a fracture

case, and I want to briefly state it here because it was a fracture case.

I was called in consultation on the third day to see a man who in sliding from a haystack to the ground had alighted upon a fork-handle which entered the anus and I do not know how far it penetrated. The man was thrown over and the fork was pulled out by one of the men present. There was no wound of the anus, the man was not in shock, had but very little hemorrhage, and any injury, if there were any, could not be discovered from any external examination with the finger or rectal speculum. The man did very well for two days; on the fifth day I was sent for, I found him in profound shock, rapid pulse, wet skin, and evidences of beginning peritonitis. I tried to get the relatives to consent to abdominal section, as I was certain we had a rent somewhere in the upper part of the rectum, at the sigmoid or somewhere in that region, which should be repaired; but this was refused, and the patient died in a few hours.

Dr. A. L. Wright, Carroll, Iowa: I think the President, in his address yesterday, "Procrastination," explains the cause of death in the case of the gentleman from Freeport.

In August last a young fellow jumped from the hay-mow with some hay he had thrown down, striking between the anal margin and the coccyx a pitchfork, tearing the sphincter muscles, entering the rectum, and, just above the reflection of the peritoneum from the rectum on to the bladder, the pitchfork entered the abdomen. His friends said the handle entered from the anal margin 1 foot. This was about 7 a. m. He was at once brought to the hospital 10 miles from our place and before noon I had opened the abdomen and had the man back in bed, within 5 hours probably of the receipt of the injury. The handle had carried fecal matter into the abdominal cavity, the abdomen filled with colored fluid, and a piece of his overalls was removed from above the umbilicus. The fecal matter in the abdomen was flushed out with gallons and gallons of water until we believed the cavity was clean. He had a hole about the size of a silver dollar just above the reflection of the peritoneum from the bladder on to the rectum, which was seized, the mucosa turned in, the wound stitched with silver sutures and closed, drainage established, and the young man made an uneventful recovery.

Another case was interesting, but proved fatal. The fork did not enter the man's abdomen. It tore the sphincters posteriorly, and how far it entered the rectum I do not know. The man was suffering considerable shock. The wound was cleaned, he made an uninterrupted convalesence, was up about the house, and on Thursday preceding the Saturday on which he had been told he could go home he was being wheeled about by his wife when suddenly he experienced great difficulty in breathing and died before any one could reach him. There was no difficulty in making the diagnosis.

Another case was a fracture of the pubic bone lacerating the urethra. In this case we pursued an expectant treatment till suppuration began, we then opened the peritoneum and found the urethra caught with a spicule of bone, kinking and also lacerating it. We succeeded in separating the urethra from the bone, put in a catheter and the patient recovered.

In a wound of this kind, the peritoneum invaded, I would invariably open the abdomen. We can expect nothing but a fatal peritonitis if the cavity is unopened. I would open the abdomen if there was any question of doubt, and I would not delay.

Dr. Bowen (closing): The discussion shows that this is not a new form of injury, although I have been able to find but little in medical literature bearing upon this particular injury to the rectum and bladder from this source of invasion. The cases which recovered under expectant treatment were, of course, those that did not invade the peritoneum. In the case reported by Dr. Wright, abdominal section was the only remedy and the only way to save his patient. Where there is any doubt, as there frequently is, about invasion of the peritoneum, I would not hesitate to do an abdominal section.

Dr. Miller (closing): In my case I felt pretty sure that the peritoneum had not been invaded. Inasmuch as the wound closed itself I let it alone and took my chances, simply watching it and keeping it clean. I looked over the literature at hand and was surprised to

find so little to be guided by. Gant in his work "Diseases of the Rectum and Anus," published in 1896, recites only 2 cases. One of them was a case in which an old gentleman fell upon a rough stick, the stick entering the rectum about 2 inches. In the attempt to withdraw it, it was found that it had a hook on it, and he pushed it up farther to relieve the pain. He again attempted to withdraw it, but there was more pain, so to relieve him he pushed it up again, until finally the stick had been introduced 6 inches into the bowel. A young student was called, and by chloroforming the patient he managed to get his finger on the hook and withdraw the stick; but the old gentleman died in 36 hours from peritonitis.

The other case he recites was that of a policeman who was shot by a burglar, the bullet struck him in the anus, passed through the rectal wall and out through the groin. The case recovered with expectant treatment.

In my case I felt pretty sure the bladder was not injured for the reason that the urine passed was clear. One thing I noticed in this case which I think it would be well to note, and that was a complete paralysis of the bowel. When I reached the patient some 2 hours after the accident the belly was distended, considerable gas was present. That distension kept up for 4 days. No gas whatever was passed—nothing passed except our washings—and he vomited quite a little the first 4 days, mostly water, for I kept very little on his stomach. On the fourth day he was able to pass some flatus; on the fifth day the bowels moved, and from that time he had no further trouble until the eighth day, when the temperature went up; but I am satisfied the temperature was not due to the wound, but to some other cause, because the administration of quinin stopped it within 24 hours. There was no shock in the case.

That is another point upon which I based my conclusions that the peritoneum was not injured, the temperature being 99 and the pulse 96. I would say that the pulse never went above 96, and from that down to 72 until the eighth day when he had his chill and fever, the temperature going up to 102 and the pulse accordingly. In the September number of the RAILWAY SURGICAL JOURNAL Dr. A. F. Barfoot of Decorah, Iowa, reports a case similar to mine, but there was a nervous condition of the patient following which lasted for, I believe, almost a year. The patient's mind was very much disturbed, he feared he was going to have further trouble unless operated upon, and in fact thought of nothing but himself and the things that might befall him as the result of this accident; but finally he was sent to college where he became interested in his studies and his nervous condition passed off.

ANTISEPTICS: THEIR USES AND ABUSES.*

C. E. WRIGHT, M. D., SCALES MOUND, ILL.

Commonly defined an antiseptic is a substance capable of preventing putrefaction, or a substance destructive of poisonous germs, but as it is the latter construction which has caused so much abuse of these agents we would prefer for the practical purpose of this paper to define antiseptics as: Substances capable of preventing the development of microbes in amounts or concentrations not injurious to human cells.

Now the ability of any chemical substance to prevent the development of bacteria of any kind in a medium suitable for their growth varies, and the amount necessary for this result can only be ascertained by a carefully conducted series of experiments on various species. We know as a result of extended experiments, that those agents which restrain the development of septic organisms, also restrain the development of known disease germs, but while we are justified in speaking of those agents as antiseptics which have been proved by laboratory experiments to prevent the development of pathogenic organisms in suitable culture media, we must exercise great care in drawing any inference from the experiment made upon one organism, with reference to the amount which may be necessary to prevent the development of another. For example, bichlorid of mercury in

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the proportion of 1:300,000 prevents the development of anthrax spores in culture media, while certain micrococci and bacilli commonly present in putrefying infusions can multiply in the presence of 1:40,000.

In considering the use and comparative value of antiseptics we will only consider a few of the more commonly used agents of recognized value and reliability, since any attempt to classify, let alone analyze, the merits of the new preparations placed upon the market every year, by the enterprising drug houses of today, would take too much time and be of very little practical value when finished, because so many of them are merely the "old reliable" in claimed combinations which do not always exist in the proportion advertised. It is a very difficult matter in comparing the observations of different investigators to arrive at the exact antiseptic value of the various chemical agents, so we will use only the average proportion which will be sufficient for the real purpose of this paper.

Bichlorid of mercury is the most eminently antiseptic agent we have, as proven by the experiments of Sternberg, Koch, Arloing, Thomas and Salmon showing that very small amounts are sufficient to prevent the germination of spores, while micrococci and bacilli in process of active growth, developed in the presence of very much larger amounts of the same agent. In the experiments it was found that 1:30- to 40,000 inhibited the growth of the pus micrococci for 24 hours and over. The solutions commonly used by surgeons vary from 1:1,000 to 1:4,000, but are much too strong for continued use; 1:10,000 may be borne by the tissues for a considerable length of time with safety, but even in that amount if used over a large surface the patient should be watched carefully for symptoms of absorption from too much of this powerful agent.

Formaldehyd gas in aqueous solution is almost as effective as bichlorid. In the proportion of 1:20,000 it inhibited the development of bacteria, but typhoid, diphtheria, and the Staphylococcus aureus, required 1:10,000.

Of the agents which are very strongly antiseptic iodin is probably the most abused antiseptic we have, owing to the many preparations claiming iodin to be present in much larger quantities than actually exists, as instanced in the report of the Council on Pharmacy and Chemistry (July number *Journal of the American Medical Association*). The inhibitory power of iodin has been placed at 1:4,000.

Carbolic acid or phenol may be rated as only strongly antiseptic, but owing to its extended use under the teachings of Lister, in surgical practice it has become the antiseptic *par excellence* according to the popular idea. The antiseptic value according to Sternberg is about 1:333. The 5 per cent solution so commonly used for washing, is a disinfectant to all organisms save spores, if exposed for 1 hour, but is very dangerous to use owing to its destructive action upon animal cells. A 2½ per cent solution may be tolerated for some time, but the only safe solution for wet dressings is 1-5 of 1 per cent. The use of 1 per cent phenol covered by oiled silk for 25 hours has caused the loss of a finger, and 1½ grams in solution has caused death by absorption.

Boric acid is probably the most valuable antiseptic we have, on account of its small toxicity, and slight irritating action. It is not a disinfectant and will not kill microörganisms even in full strength although a 8 per cent solution inhibits the growth of such bacteria.

Sodium chlorid is very feebly antiseptic and requires 1:6. Its power probably depending on the density of its solution being incompatible with that required for the microörganisms.

Having considered the antiseptic strength of these representative chemical agents we are confronted by the fact that the average surgeon is too careless in his daily use of such powerful, and poisonous drugs. We have all seen bruised, lacerated or incised wounds which have been very sluggish and slow in healing and have attributed the fact to some inherent debility, or constitutional dyscrasia in our patient, while if the truth were known, the wound had been cleansed with some agent in disfectant concentration, and the reparative power of the cells inhibited for the time being. If antiseptics are to be used at all let them be used in such concentrations as are not injurious to the tissues, although right here, the question arises are such

solutions of any benefit to the patient whatever, or are they only a salve to the conscience of the careless and inefficient surgeon?

We have seen that the micrococcus of pus will multiply in 1:400,000 of bichlorid and that 1:10,000 will inhibit in culture media only for 24 hours, of what value would the same solution be if only washed over strong growing micro-organisms, implanted in wounded tissues? The same argument applies to all other antiseptics. If, however, the same solutions be applied continuously in the form of wet dressings the agent may exercise a certain amount of inhibitory power, and thus give Nature more time to prepare those protective bodies which have so recently been discovered by Wright and which we see and read so much about at the present time. To use stronger solutions is dangerous. While the tissues of some individuals may stand them, others will not.

I have seen a finger lost from a single application of the ordinary commercial formalin in 10 per cent solution. The house surgeon in a large department store in St. Louis dressed the finger of one of the clerks who had scratched it on a nail, with four or five thicknesses of gauze wet in 10 per cent solution and told her it would be all right in a couple of days. Four days after when I saw it, gangrene had set in, the finger was dark and numb, and had to be amputated at the end of a week.

Boric acid as a rule is probably the safest of all the antiseptic agents, as even in concentrated solutions it has never caused the death of tissue. Some patients complain, however, of severe irritation and burning, when strong solutions are applied over large areas.

Now the conclusions which we would draw from the above investigations as applied to railway surgery are these: Use antiseptics if you will, but do not use them too strong. First of all see that your wound is rendered as nearly aseptic as human agency can render it. Remove all cinders, gravel, clots and foreign bodies of every kind. If necessary anesthetize your patient and use plenty of sterile water, soap and scrubbing brush, even though onlookers may call you a brute for so doing. If you can primarily remove all the infective material and apply aseptic dressings, Nature will do the rest, if proper drainage is given when needed and antiseptics will not then be required, and our patient will recover if we scrub more and "dope" less.

DISCUSSION.

Dr. O. B. Quinn, Macomb, Miss.: I want to congratulate Dr. Wright on his paper; it is one of the best along that line it has been my good fortune to have heard. His winding up somewhat took the wind out of my sail on the line of the application of dressings and also the use of antiseptics. Years ago I used the bichlorid solution and bichlorid gauze to quite an extent; in my surgical work today this still forms a certain line, but it is very limited now. The essayist admonishes us to render the wound clean or aseptic before leaving it, and then to use, as I take it, the simplest form of dressing, and I found in this gentleman's own paper the very ideal, at least my ideal, of a moist application, if one be applied, in those cases for after treatment.

You cut out your strong solutions of any of the phenols, regardless of whether it is carbolic acid or any of the proprietary mixtures which are so free on the market nowadays with instructions how to use them, and use a solution of from 1 to 4 per cent of boric acid, which combines elegantly with from ¼ to 1 per cent, as the case may require, of carbolic acid. This makes an ideal solution in my practice, to be used where I want to use a moist and aseptic dressing. I just want to say a word, almost unnecessary I know, about the danger of poisoning, gangrene and other troubles and which I have on several occasions encountered—I am glad to say not in my own individual use—as the result of the application of phenol preparations, producing paresis of the nerves and following up into a dry form of gangrene, and by that which was a dilute solution. If in the case referred to the gentleman in the store had had the pure aricle of 95 per cent carbolic acid, and it had been used to cauterize the scratch and then bound upon it, there would have been no danger of the complication that followed. The trouble was that the mixture with water rendered it capable of absorption and a destructive

action upon the peripheral nerves followed.

Dr. L. W. Littig, Iowa City, Iowa: I wish to confine my remarks to the closing words of the paper just read: "The more you scrub the less dope you will require."

In thumbing over a bound volume of Langenbeck's *Archiv für klinische Chirurgie* a few days ago, I noticed a very exhaustive article on the "Disinfection of the Hands," by Professor Schumburg of the German army. The author made a very long series of careful experiments and I wish to call your attention to one or two. An expert surgeon scrubbed his hands for 12½ minutes, using sterile soap, sterile brushes, and sterile water. He changed the water 5 times taking a clean sterile brush each time. His hands showed more microbes per cubic centimeter of surface after than before the scrubbing. The more you scrub the more microbes you stir up. Schumburg, by using 2 parts of absolute alcohol, 1 part of ether, and ¾ of 1 per cent of nitric acid, with a gauze sponge, and two and one-half minutes of time, removed 99.95 per cent of the microbes on a given surface of the hands. Almost equally perfect results are obtained by using denatured alcohol instead of the absolute alcohol, ether, and nitric acid solution. To irrigate with a sterile normal salt solution or simple sterile water is correct. I cannot understand how a wound can be scrubbed.

I wished to call attention to two points only: That scrubbing loosens up microbes, and that denatured alcohol is of great value as a deoleating mechanical cleansing agent. Schumburg advises ordinary soap and water, then 2½ minutes with the alcohol, ether, and nitric acid (denatured alcohol practically as good) and a final 1-1000 bichlorid of mercury solution. I supposed that scrubbing the field of operation and that scrubbing with antiseptic irrigation of wounds, were things of the past.

Dr. Wright (closing): I will be very brief in closing. Referring to the remarks of the last speaker, I was speaking of surgeons as a whole throughout the country. I care not where you go, you will find nearly every surgeon using antiseptic solutions in washing wounds. We see all kinds of germs and read about them, and still there are constantly advertised various kinds of antiseptics in regard to which it is said that all we need to do is to wash our hands in it and go on with a major operation. The only proper way is by scrubbing. There are methods and methods of scrubbing wounds. The only way to do is first to soften the tissues by thorough washing, but what I meant in speaking of scrubbing was where the wound was full of cinders and dirt of all kinds; it is impossible to get that out without the use of the brush, and forceps often, but the brush is the main thing to use, and a wound can often be rendered clean in that way where it could not be by the simple washing or douching.

RAILWAY SURGERY IN THE ORIENT.*

W. F. PIERCE, M. D., CARSON, IOWA.

As I am out from under the influence of the Mikado and do not expect to submit this to his censor for the privilege to read or publish nor looking for any decorations for literary talent, I will give you a few items which are authentic as I found them in Japan and not colored *"a l'orientale"* nor "yellowed" for political use in San Francisco; a kind of prelude to the subject of my paper coming afterwards.

In the first place let me inform you here that I have not been in the habit of writing papers. My strong hold has been listening to others, so if I break off some of my thoughts rather abruptly and do not round them out in good strong rhetoric and lead you up to the dizzy heights of oratory do not be disappointed nor disheartened and I will try and interest you in some thoughts and items that you will probably not find elsewhere. All quotations from other writers and historical references will be barred.

The "Flowery Kingdom" that we hear so much about I think is mostly the "pipe dream" of some steamship advertiser, for the flowers do not compare in varieties, colorings, beauty or perfume with the flora of the United States;

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

many of their flowers are oddities and any rose will stand out a great deal more prominent with an ugly, dirty coolie for a background than it would in the arms of a pretty American girl: in the latter case I think most railway surgeons would hardly notice the flowers at all. It does not take one long to learn that for lying, cheating, stealing, deceit, etc., the Nipponese has the Chinaman distanced so far that he will never catch up. If there is any place on earth that needs a pure food law it is Japan; everything seemingly that can be imitated or adulterated has been attended to, and no matter how base and vile the imitation it is sold openly and above board. Butter, cheese, almost all edibles imported, wines, in fact, anything that is canned or bottled are counterfeited and the labels copied accordingly.

I was told that Elgin creamery butter had a large trade at one time, the person selling it offering to replace any that was not up to the regular standard; he commenced to have cans brought back the contents of which were something awful; then he heard of others who were selling at less than cost price and having hard work to dispose of the goods; upon investigation he found the butter rank but there was the label and all the marks; a friend in reading the label carefully discovered one of the English words misspelled on the spurious article, otherwise can, wrapping and all could not be told from the genuine.

So it is with a great many things that are imported from other countries. You cannot buy them there and feel safe in regard to what you are getting.

It will strike you forcibly when you notice that in the hotels, banks and company offices the man who handles the money is a Chinaman. In the bank at Tokyo where I went to draw some money, one Jap. counted it out and shoved it over to another who verified it, then took it to a Chinaman who checked it up and handed it out to me. They tell me that even in the barrooms you are waited on by a Japanese, but a Chinaman always takes the money and gives you your change. So much for their trustworthiness.

In regard to religion they worship at Kamakura, near where Commodore Perry and his fleet landed and made the first treaty of friendship half a century ago, the largest copper god in the world the "Dai Butsu," and while that deity has more worshippers there than in the United States, it seems to have more of a financial effect here. While he is up everything appeared to be all right, but when he came down there came near being a panic.

The ticket sellers at the depots, like Yokohama, are women. In the cities the students and some business men wear European clothes, but it is hard sometimes to tell a girl from a boy in their native dress, their costume being so much alike, the kimona. In the rural districts where full dress is the mode, it is not so difficult, of course, some of the costumes are of such an ethereal nature that it is rather embarrassing to a foreigner to say the least.

The toilet facilities at some of the railway stations are crude, fashioned after a cement watering trough, used by both sexes and at the same time without any apparent confusion to their modesty whatever.

The style of foot wear—wooden shoes—keep their feet dry on muddy and wet pavements and at a station, when a train arrives and is being unloaded, make a racket like a drove of horses going over a bridge.

Japan, as I understand it, has only had railroads about thirty or thirty-five years and for that time she certainly has made rapid advancement, in this as well as manufactures, arts and war. There is no denying that the chief example she imitates and is trying to surpass is the United States and in the minds of a great many of her people she has that example distanced already.

Her cars are ancient English affairs. The first-class coaches on the train we went to Tokyo on were about 14 feet long, 6 or 7 wide and about 7 high, with two compartments. There was no ventilation provided for in cold weather, carpets were foul, smoking allowed and the sanitary details averaged with some of our old time smoking cars with the expectoration and all its accompaniment. The seats were along the sides of the car and there were no toilet arrangements, although on one limited

train to Osaka there were toilet rooms in the first-class carriages.

Now to come to the subject matter properly, while in Yokohama I called at the United States Consulate and inquired of the Consul where I could get information in regard to how railway surgery was conducted in that country. He referred me to Dr. H——, who, he remarked, was one of the foremost surgeons of Japan and well posted in everything and furthermore could speak English.

Arriving at his office I was admitted by his attendant to the waiting room, which was luxuriously furnished with matting on the floor, a wooden bench and small brazier of ashes which had been used to heat the apartment—6x10 in size. It not being very cold no fire was supposed to be needed, although my temperature ran down to below freezing in about 15 minutes, the time which elapsed before being admitted to the doctor's consultation room. This compartment was not large and was heated with a gas fireplace, the caloric rays from which did not make a too sudden change, so I did not remove my overcoat. There was a leather upholstered operating chair, 2 wooden chairs, a desk, desk chair and some sample bottles on the desk. I don't think the room had been sterilized that morning and may not have been renovated for a week. The doctor had on American clothes and had probably just returned from a visit to the country from appearances. He was a bright looking man and struck me as being somewhat conceited, a virtue I think almost universal among the educated classes in Nippon at present. He gave me a hearty welcome and after passing the time of day, in answer to the interrogation: "Can you tell me what arrangements, if any, the railroads in Japan have for surgical supervision?" answered very felicitously while rubbing his hands, "About the same as in America." The following colloquy occurred:

"Do they have a surgeon in chief and also local surgeons at different points on the line?" "Oh, no! You see they are mostly government roads."

"Who look after any that are injured?" "The physicians of the place where the accidents occur."

"How about hospitals?" "The government requires every large city to operate a hospital."

"In case of an injury who pays for the attendance?" "The person who is injured."

"Suppose the accident was caused by the carelessness or incompetency of the employes?" "Ah! that would make no difference, they don't have to be there."

"If the unfortunate one, who was a trespasser had no money and say, had both legs cut off, the same being caused by the criminal carelessness of the employes, who pays for the doctor and hospital attendance?" "The person would, of course."

"Then they would not fine him for being in the way?" "I don't think so." (This question was rather impertinent but it came to my mind from an instance that happened in old Mexico when a train I was on ran into a herd of cattle and killed quite a number. I remarked to the conductor that from the paucity of the passengers on the train the railroad would not have much in the till from this trip when they had paid for the stock he had killed. He answered, that he did not know why, as the railroad did not have to pay for them. He would report the facts at the next stop and the authorities would send back an officer and arrest the man who owned the cattle and fine him for obstructing the mails.)

"If an employe is injured, how about that?" "No difference."

"In regard to sanitation, are the cars disinfected?" "Yes."

"How often?" "I don't know."

"In case of epidemics and persons with contagious diseases ride on the cars what is done?" "The cars are disinfected."

"Who reports the cases?" "The employes."

"Do they examine the passengers?" "Oh! no."

"How do they find it out?" "From the doctor who is called to see them."

"Supposing a doctor is not called, or not called until the next day, how about that?" (Rather irritatingly) "Oh! I don't know. There have not been any epidemics for a long time."

"Do they make any examination of their employes before hiring them?" "Yes."

"What kind?" "Oh! examine their muscles, legs, speech, hearing and sight."

"Who examines them?" "The applicant's doctor."

"Does he examine their eyes?" "Yes."

"For color blindness?" "Yes."

"Who pays him?" "The person examined."

"Are they all capable to make the tests, understand them and have, say, the charts, yarns, etc., to do the work properly?" "Oh! that would have to be done by an expert oculist and they have one they consult, but (impatiently) you had better see the Bureau of Communications, I have not time to go into the subject."

After thanking him for kindness and information and begging his pardon for intruding upon his time, etc. I bade him good-day. He remarked that he was very glad to have met me and any further information he could give would be cheerfully furnished and to call again.

One day while at Tokyo I engaged a jinrikisha and calling upon the United States Minister got a letter of introduction to Mr.——, I won't try to give his name, the Director of the Bureau of Communications. When I got to the place where he should be there had been a fire the night before and the structure, whatever it was, had become a sacrifice to the Shinto god that takes charge of pyrotechnics, so we had quite a time locating the new quarters. At last the place and individual was found and I was ushered into his presence by the grand keeper of the outer door, to whom I had given my card. Mr. so and so, greeted me in English and I stated to him the object of my visit. At first he was like the physician, claiming the management was similar to that in America, but upon further questioning he admitted that they had no surgical department and that the accidents were attended by the nearest physician, whatever his qualifications might be.

One thing that impressed me very strongly in regard to the Japanese is their claiming everything in sight, and as I have said before, the United States seems to be their idea of what is the best. I am forced to think that much of this sanitary precaution of bathing before going into battle we read about is only an ebullition from the fertile brain of some American reporter. The fact is, that next to the Hindoo whose religion requires him to bathe his body before he eats, the Japanese is a great stickler on laudrying himself even though he has no change of raiment. These fanciful writers of the virtues of the little yellow man in the flowery kingdom are quite similar to the emanations of the advertising agent describing the beauties of some winter resort in Florida.

India is one of the most interesting and convenient places to travel in the world; it is intensely interesting and would be delightful if the cuisine was as good as our second rate lunch counters for one does get tired of eating bread and eggs. In that hot climate everything changes quickly; meat, vegetables, fruits, etc., so foreigners are cautioned against eating them. The water, well you buy imported water from England.

The cars are kept in a fairly clean condition. The first-class coaches are large, roomy and accommodate 6 persons in the daytime and 4 at night. There is an upper berth on each side of the compartment which can be let down at night for the accommodation of 2 passengers and the seats beneath can be pulled out for 2 lower berths. Each passenger furnishes his own bedding, the bunks are comfortable, better than a Pullman for ventilation, and there is no extra charge. There is also a toilet room for each compartment, provided with a wash bowl and closet. My wife and myself were given a compartment to ourselves through India from Calcutta to Ahmedabad on the coast and I will state that it was like a private car for comfort and ease. At each stop where you alighted from the train an attendant, who could speak English, would open the door of your carriage, take your luggage and call a coupé to take you to the hotel you designated, and when you returned to take the train one met your carriage, took your baggage, and when the cars arrived would find you a first class compartment, deposit your luggage therein and if it was in the evening, make up your berth. For this all that was expected was a 2 cent tip, which I assure you was freely and cheerfully given, sometimes with interest.

The number of servants one encounters at the hotels is sometimes appalling as each servant will do only one thing, namely, attend to your baggage, lights, bed, room, get the water, etc., and when you leave they form open ranks, double column and you pass down the avenue like a maharajah going to his bath, distributing your panic-destroyers to each, receiving therefor a profound bow and thanks that make you feel like a millionaire. The smallness of the tips expected makes it far cheaper than putting up 25 cents in Chicago or Denver for a pitcher of ice water and another to the elevator boy, not counting other claimants.

In regard to railway surgery in India, the arrangements are a great deal the same as in this country. There are surgeons appointed for each large city, junction points and terminals, and hospital facilities arranged for. Each surgeon is paid for what he does, and is given an annual pass over the line; so a general manager whom I met in Bombay informed me, but the liabilities of the road in regard to accidents, whether by maiming or death were nil, he said, it was only done out of charity. Still all through India there is an unwritten law that they have to be careful of, that is, to deal gently so as not to excite the natives or there is liable to be an insurrection.

A physician, who has charge of the research hospital at Paral where the anti-plague serum and antivenene is prepared, said they were handicapped in using the serum as a preventive a large number of times, because if anything happened and the person died, they might claim they were poisoning them on account of their religion and then there was an uprising; others would not allow it to be used for fear that it was against their religion. They cannot exterminate the rats that are the cause of plague in some parts, for the Hindoo faith does not allow the killing of any thing; so it is no wonder that thousands die every year from plague, tigers, snakes, etc.

I might add that one habit of the Hindoos was attractive and that was the cleansing of their teeth after every meal, and it was done thoroughly, if they had no brush they would use a stick or their fingers.

THE USE OF ADRENALIN DURING ETHER ANESTHESIA.

CHARLES S. VENABLE, M. D., CHARLOTTESVILLE,

Recognizing that my experence in the use of adrenalin during ether anesthesia is but very limited, covering a course of only 18 cases, and knowing the many fallacies attendant upon too early conclusions, I feel a great hesitancy in making this report. However, owing to the uniform result that has attended its use, I am prompted to do so now. I found 25 per cent aqueous solution of the standard 1 in 1,000 gave the best results, and by first pouring ether in the towel cone and spraying the adrenalin on it, depending on the ether to vaporize it sufficiently for inhalation, was the best mode of administration. Three to six minute intervals are sufficient for its use and a total of from ½ to 1 oz. of this solution is enough for an operation lasting from thirty minutes to an hour. The effects are a more uniform etherization, the pulse becoming steadier, slower and of better character more rapidly than under ether alone; respirations are quiet and regular, the bronchial secretions practically checked, and the progress of the operation not interrupted.

These cases were not selected, and among them were old alcoholics; two women over 60, one of them nearly 80. Three were very long, tedious operations, lasting over two hours, and in none was any stimulation required.

Recovery from the anesthetic was uniformly good; there was practically no post-operative shock, and no stimulation was needed in any one of the cases; only two patients vomited at all and very little nausea was complained of.

From the foregoing facts I conclude that owing to the contraction of the smaller vessels the bronchial glands secrete less mucus, and there is better æration in the bronchioles and pulmonary vesicles, less ether is required, and there is less probability of ether-pneumonia. The adrenalin, acting generally from absorption, is a powerful stimulant; it materially lessens shock, lessens the capillary ooze at the field of operation, and is of great benefit to the much weakened patient.—*Virginia Medical Semi-Monthly,* Feb. 22, 1907.

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ANNUAL MEETING.

The fifth annual meeting of The American Association of Railway Surgeons will be held in Chicago, October 14, 15 and 16, 1908.

ORGANIZATION OF THE I. C. SURGEONS.

The preliminary meeting of the surgeons on the Illinois Central lines preparatory to organization of a company surgical society, will be held in the Hotel Gayoso, Memphis, February 27 and 28, 1908.

A number of papers have been promised, enough to render the full two days' meeting very profitable.

MEASUREMENTS OF THE LIMBS.

Attention was first called, by Wight, we believe, to the difference in the length of the lower limbs normally. His statements were corroborated later on by Thomas G. Morton, of Philadelphia. The latter observer measured the limbs of 300 boys at Girard College, and found asymmetry the rule, the difference varying from a fraction of an inch to an inch. In another column will be found some results obtained by a French observer, who measured the circumference.

In a recent article J. H. Pringle* points out a new method of measuring the length of the neck of the femur. He says it has often seemed to him the value of measuring this length, as a clinical aid to the diagnosis of injuries, or of diseases with resulting deformity about the hip, has hardly been appreciated as it deserves, and is not carried out so often as it might be.

In addition to Nélaton's line and Bryant's triangle, a method, possibly less known than these two, but one that is often of service, is that of Professor Chiene, who recommended that two lines should be taken, one between the two anterior superior spines, and the second between the two great trochanters. With the neck of each femur normal, these two lines should be parallel, while in the case of shortening of the neck of one femur the lower line inclines to, and makes an angle with, the former. But in the slighter degrees of shortening, he finds that to get an approximately accurate idea, it requires two people who can recognize

*Practitioner (London).

the bony points, and the second person is not always available. There is a further disadvantage in having to estimate, usually to guess at, the angle of divergence, which may lead to inaccuracy later on in the course of the case, when one desires to decide whether the condition is improving or progressing.

For some years past now, Pringle has adopted a method, which is at once simple and easy to carry out, and which, after a considerable experience of it, seems to be thoroughly trustworthy. It is preferable to measure it with a regular measuring tape, so a definite idea, in inches or centimetres, of the difference between the two sides can be obtained, but it can be quite efficiently and easily carried out with a piece of string or tape. In that case he measures from the tip of the great trochanter to the tip of the external malleolus, in order to determine, in the first place, if this portion of the limb is of the same length on each side, or it may be measured from the great trochanter to the most prominent point of the external condyle (really the ridge of the groove for the popliteus tendon); this will eliminate any inequality in the length of the limb from the knee downward. With the information that the limbs, or, at any rate, the femora below the trochanters, are of the same length, measure from the anterior superior spine to the tip of the external malleolus (or popliteal ridge of condyle) on both sides; if this measurement is less on one side than the other, it signifies shortening of the neck of that femur. Of course, any serious deformity of the shaft of one femur will tend to throw out this measurement, but such cases are very rare.

PATENT MEDICINES IN JAPAN.

In connection with Dr. Pierce's contribution which is to be found elsewhere in the present issue, an interesting side light is thrown on the Nipponese character by an article published in a recent number of the *British Medical Journal*. This is founded on a report by Mr. W. M. Royds, one of the British consular officers in Japan.

It seems the patent medicine industry is of long standing—about 250 years. It was started in a town called Toyama, and this has remained the great center of the trade ever since. The governor of the province in which the town was situated took great interest in the trade in such articles, and has been looked on as the chief patron of the industry. So much so, that the 200th anniversary of his death was celebrated in May, 1906, by a festival on a grand scale, organized by the dealers in Tokio.

In 1682 a physician learning of the governor's interest in medicines visited him and presented some made from a formula handed down in his family for generations. The name of this ancient remedy is *han-gon-tan*, meaning "calls back the dead to life." With this high-sounding appellation we are not surprised to learn the preparation has ever since been a household word throughout the country.

In the year 1877 the government took steps to control and tax patent medicines. Some five years later owing to a new stamp tax the business commenced to decline, and seemed on the verge of extinction. In a few years some relief was afforded by a regulation providing for the exchange of stamps remaining on unsold medicines.

The export of these medicines has steadily increased in the last two years on account of a bill passed by the Japanese parliament in 1905 imposing a 10 per cent *ad valorem* tax with exemption for medicines exported. When the peddlers come round annually, the customer takes enough to supply his family for a year, and on the next visit, the peddlers collect the money for what has been consumed, at the same time exchange the left-over supply for new stock free.

There were—in the year 1904—3,102 licensed manufacturers in Japan, who made nearly 10,000 different kinds of medicine. The value of their products for this year was about six millions of dollars, while in 1886 the value was only two millions. Toyama, the town referred to before, produces about one-quarter of the total.

We learn from Royds' report that the names used generally refer to the alleged curative properties of the medicines, for example, "brain-healing pills," "poison-expelling pills,"

"spirit-cheering pills," "heal-everything powders," "1-dose-healing powders," "life-supporting powders," "touch-the-spot pastilles," "second-to-none plasters," "boil-breaking ointment," etc. These medicines are never sold in a liquid form, but are distributed usually as pills, powders, pastilles and pastes. Dried roots, leaves, herbs, etc., are also sold to be steeped in hot water and the decoction drunk.

The material interests of the dealers are watched over by several guilds. A special one of these located in Toyama loans money to dealers to start business or to increase their output. This town boasts of a dealer's club with 3,000 members, a school for instruction in medical matters connected with the industry, founded in 1893 with 200 students, and finally the *Toyama Patent Medicine Magazine.*

RUPTURE OF THE INTESTINE FROM A BLOW WITH A BAYONET.

A musketeer, who had contrary to orders not worn a leather apron during the bayonet exercises suffered a rupture of the intestines from a blow in the right side of the abdomen, with the head of a bayonet. He was taken to the hospital, where four hours later he presented the following picture: marked facies abdominalis, pulse regular, accelerated, 90, small, temperature 36, respiration superficial, costal type, legs drawn up. Abdominal muscles rigid and very sensitive, no sign of effusion. No rupture of the bladder. Operation 4½ hours after injury. On opening the abdomen a cloudy flocculent exudate came away. The intestines on right side brownish red, congested, left side appears healthy, on examination a perforating wound, as large as a bean was found in a loop of the small intestine, near the mesentery; closed with Lembert's sutures, no other perforations found. Abdominal cavity washed with saline solution. Drainage, recovery uneventful. The history of the case confirms the experience, that circumscribed blows upon the abdomen are more apt to rupture the bowels than those of a diffuse character.—*Military Surgeon.*

Translations

COMPARATIVE MEASUREMENTS OF THE LIMBS.

H. MASINI, M. D., MARSEILLES, FRANCE.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

The medico-legal expert is often called on to make comparative measurements in cases of accidents. It seemed to me that it would be valuable, to make some comparative measurements and ascertain the differences to be found in the same subject under normal conditions.

The calf of the leg was measured in 207 subjects, and the arm in 230 subjects. The average for the calf was 30 cm. 82 on the right and 30 cm. 71 for the left, a difference of Ocm. 11 in favor of the right. Of the 207 subjects 125 had the right calf larger than the left; in 69 the left was larger, and in 13 the two sides were equal. The occupations of the patients seemed to have no influence on the result. So we may calculate that about 60.38 per cent of patients will have the right calf larger; about 33.33 per cent the left calf larger, and in the remaining 6.28 per cent the two sides will be equal.

The greatest difference noted—4-5 inches—occurred in an old day laborer of 72 who had been in bed for six months. The difference in the arms of this patient was 1 inch, also in favor of the right side.

The arms were measured around the middle of the biceps, the limb being extended with the palm in front. Of the 230 patients, 209 were right and 21 (10 per cent) left-handed. Of the 209 right-handed individuals in 174 (83.2 per cent) the right arm was larger; in 16 (7.6 per cent) the left arm was larger, and in 19 (9 per cent) both arms were the same size.

Of 174 right-handed subjects with the right arm larger the average difference was 0.64 ctm., the greatest difference being 3/5 inches. Of the 16 right-handed individuals with the left arm larger, the difference was 0.68 ctm.

In all the 21 left-handed individuals the left arm was the larger, except 2, 1 with an old fracture of the left arm, the other had been in bed for 11 months.

Of the 16 right-handed individuals who had the left arm larger, in 13 there was no apparent reason, 1 had had a fracture of the right arm; 1 had articular rheumatism of the right arm, and 1 had been in bed for 4 months. The majority of the subjects having the left arm larger than the right were day laborers and housekeeperrs. The greatest difference in the arms was found in a day laborer of 28 who was left-handed; in this patient the difference amounted to 2/5 inches in favor of the left arm; the difference in the calf in the same individual was 1/5 inch, also in favor of the left side.

In short of 100 individuals 60 per cent will have the right calf slightly larger than the left, 33 per cent will have the left side larger, and the remaining 7 per cent will have the sides equal.

It is surprising to find 16 right-handed individuals, yet with the left arm larger than the right; there was nothing in the interrogation of these patients or in their examinations to throw any light on the cause.

Finally it must be noted that these measurements were all obtained on patients in a hospital. In healthy subjects the averages should be higher, but the average of the differences would retain its value.—*Gazette des Hôpitaux.*

FRENCH SURGICAL CONGRESS, SESSION 1907.

CHRONIC SURGICAL AFFECTIONS—TUBERCULOSIS AND CANCER—IN THEIR RELATIONS TO ACCIDENTS TO WORKINGMEN.

I. TUBERCULOSIS, E. JEANBRAU, M. D., MONTPELLIER, FRANCE.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

The pathogeny of surgical tuberculosis has assumed a practical aspect since the passage of the French law of 1898 concerning accidents to workingmen. In order to equitably estimate the damage sustained by a workingman with tuberculosis following a trauma, it is necessary to know the rôle which accidents play in the pathogeny of external tuberculosis.

There are three possibilities: (1) A wound is followed by local tuberculosis; (2) a subcutaneous trauma (contusion or sprain) is asserted to be the cause of the tuberculosis; (3) in a subject affected by tuberculosis, an open or subcutaneous trauma is followed by fatal miliary tuberculosis.

In the first instance we have to deal with tuberculosis by inoculation.. The accident having introduced the Koch bacillus through the breach which it has caused, is itself the cause of the affection. Without it no tuberculosis would be possible. This is the only circumstance where the accident plays a really creative rôle.

As regards the second possibility, subcutaneous traumas have for a long time been accused of giving rise to surgical tuberculosis. But the researches of MM. Lannelongue and Achard have demolished the doctrine of traumatic "white swellings" defended by Baudens, Verneuil and Ollier and strengthened for 20 years by intemperate explanation of the experiments of Max Schüller. At the present time in order to understand the part played by trauma in the genesis of local tuberculosis we must collect clinical and experimental facts, as well as the post-mortem findings.

The following clinical facts are adduced by Lannelongue and Achard to prove the slight importance of trauma in the localization of surgical tuberculosis: (a) it is the less severe accidents, such as contusions without precise localization, and slight sprains, which are most often followed by tuberculosis; (b) in phthisical patients, fractures, dislocations and major traumas are not the origin of bacillary localizations; (c) wounds in tuberculous individuals cicatrize normally; (d) injections of serum and of drugs do not give rise to formation of a cold abscess in phthisical subjects, such as frequently follows from suppurations in patients infected with staphylococci, streptococci, etc.

Any conclusions founded on experiments

prior to the discovery of the tubercle bacillus can be accepted only provisionally. Lannelongue and Achard having repeated Schüller's experiments, but with pure cultures, instead of sputum or caseous débris, could not produce white swellings. Similar results were obtained by Krause, Friedrich and Honsell. However, by using attenuated cultures and making histologic examinations of the joints of animals experimented on, Petrov in 1904 pointed out two important points: (1) Tubercle bacilli may be found in the epiphyses of rabbits as long as 3½ months after inoculation (whether traumatized or not) which have been inoculated intravenously, and without producing any macroscopic lesions; (2) by violent traumas produced some hours before inoculation, Petrov was able to cause specific osteo-arthritis. Hence this author has demonstrated that the bacillemia provoked by intravenous inoculation may fix bacilli in non-traumatized epiphyses, also that a preliminary trauma favors production of fungous osteo-arthritis.

Finally, the revelations of necropsies show that many individuals are tuberculous, though not aware of it, consequently are in the same condition as inoculated animals in which sprains have been caused. Nageli has shown that in the hospital patients of Zurich 73 per cent of the subjects dying between 14 and 30 years of age, and from various diseases other than phthisis, showed active or extinct foci of visceral tuberculosis.

These facts show us that subcutaneous trauma may play three different rôles: sometimes it reveals unsuspected tuberculosis in the patient, for instance when tuberculosis follows a sprain; sometimes it hastens the progress of the disease by determining rapid suppuration; lastly, an accident localizes tuberculosis, by creating in a subject with latent tubercles disseminated through the body, a traumatic focus in a locality previously healthy and not invaded by tubercle bacilli. If there is a focus near the point injured, infection is carried along the lymphatics. If not, it is necessary that a transient bacillemia,—due to the penetration into the blood of bacilli, which have escaped from a specific lesion at a distance—carries the microbic agents into the traumatic focus.

In some exceptional cases, the contamination takes place after the accident, the trauma in such cases serves as the "nursery" for the tuberculosis.

As to the general miliary tuberculosis coming on immediately after a subcutaneous or open trauma, this is, as a rule, a mere coincidence, as may be verified by necropsy. More rarely, an accident may cause the outbreak of rapidly fatal miliary meningeal tuberculosis or general miliary tuberculosis in a tuberculous subject.

Coming now to the application of the foregoing facts to the estimation of the damages to be awarded, we should conclude as follows: In the first place, pre-existing tuberculosis brought to light by the accident calls for only temporary indemnity; in the next place, tuberculosis aggravated by the accident, justifies a reduced indemnity, for the accident was responsible only for the aggravation; lastly, tuberculosis inoculated and localized in an individual apparently sound entitles to all the indemnities provided for by the law of 1898.

French jurisprudence, however, does not take cognizance of pre-existing diseases. It suffices for the accident to have clearly determined an outbreak, aggravation or localization of tuberculosis, in order to have damages awarded as if the trauma had started the disease up in a perfectly sound subject.

All the medical expert has to do, then, is to determine whether the accident had really influenced the course of the disease, or if it merely lighted a pre-existing focus. In the former case the injured party would be entitled to the whole of the indemnity provided for such incapacity. In the second case, there will be no occasion for damages, since the accident played no part in the development or aggravation of the disease.

This doctrine will simplify and lessen suits for damages. On the other hand it will perhaps have an untoward effect on the employment of weak and sickly workmen. It would seem desirable that the law be so changed as to take into consideration pre-existing dis-

eases, though reducing the amount of indemnity, when the accident has played but a secondary rôle in the development of a local tuberculosis.

(To Be Continued.)

ABOLISHING A DIRTY PRACTICE.

In our news columns a few weeks ago it was stated that the progressive health commissioner of Pennsylvania, Dr. Samuel G. Dixon, has published an order forbidding Pullman car porters to brush the clothes of passengers in the aisles of the cars. The endurance of this noxious custom for so many years is an evidence of the long suffering patience of the American traveling public. Apart from its glaringly unhygienic features, this scattering of dust through a car and over the already sufficiently dirty and uncomfortable passengers has long been voted an unmitigated nuisance. The practice was instituted by the rapacious porters as a means of extorting dimes and quarters from their unwilling victims and has been endured simply because no one wishes to make himself conspicuous by audible protests. It is worse than useless as a means of cleanliness, for the clothes of those first brushed are as dirty as before by the time the whole carload has been curried, and what dirt has not settled back on the external parts of the travelers has filled their nostrils and lungs—not only the dust of the road, but the germ-laden accretions from the garments of men in all conditions of health and disease. Other state boards of health that have the authority to issue and enforce orders for the protection of the health of the communities they serve, will do well to follow the example of Pennsylvania in putting a stop to this most insanitary and in every way objectionable practice.—*Medical Record.*

When the pain in the rectum is of a *dull, aching* character, more or less continuous, and associated with some discharge, it may be due to fistula, ulceration, hemorrhoids, prolapse, polypus, villous growths or carcinoma. The pain of this latter is often associated with abdominal pain, caused by stenosis produced by the growths (Wallis).

Extracts and Abstracts.

SANITARY CONDITIONS IN JAPAN.

P. M. ASHBURN, M. D., AND C. F. CRAIG, M. D.,
UNITED STATES ARMY.

Certain factors influencing sanitary conditions in Japan are worthy of mention because of their absence from America.

First and probably the most important of these is the manner of disposal of waste matters, particularly human excreta. With few exceptions, the water-closet is unknown in Japan, and all urine and feces are received in large, glazed earthenware jars. Here they decompose and at intervals the jars are emptied, their contents removed to wooden pails or casks with tight-fitting covers and hauled to the country, there to be spread on the gardens, rice fields, etc. This practice is general, so general that in the country village of Gosen in Echigo province, and through the surrounding farming district, the smell of feces and ammoniacal urine could not be escaped at any time of the day. It came on the breeze from the fields, it permeated the houses from the jars, and whether walking, riding, resting, bathing or eating, the stranger is conscious of the odor. In time, of course, one does become accustomed to it, as the Japanese have, so that the odor is not a matter of the greatest importance. The fact typhoid fever and bacillary dysentery are the main causes of admission to hospital is, however, of great importance, and from a very few observations we would hazard the opinion that intestinal infections with verminous parasites are also unduly common. Whether or not the use of feces as a fertilizer causes these conditions is, possibly, a debatable point, but it is not unlikely that it is at least a factor in their cause, and the Japanese recognize that probability. On the other hand the small cultivable area of Japan and her large population make intensive cultivation and fertilization necessities and the problem now being faced is that of using these products as fertilizers but avoiding the danger that at present accompanies such use.

An interesting fact is that, though ankylostoma infection is relatively common in Japan and though so large a part of the rural population works in rice fields, in water contaminated with feces, severe infections are said to be most unusual. Our personal observation would indicate that the same is true in parts, at least, of the Philippines. Apparently the bright sunshine, the abundant water supply, the preliminary storage of the feces, or all of these, reduce the chances of infection in this manner. Both *Ankylostomum duodenalis* and *Necator americanus* occur, but, according to Dr. Miyajima, the former is the more common.

Another way in which the present method of conserving the excreta may tend to the diffusion of typhoid and dysentery is by the breeding places for flies offered by the feces jar under the house. This jar appears at times a writhing mass of maggots.

A feature of Japanese life which is also strongly impressed on the summer visitor, whether in Nagasaki, Tokyo, or the farming districts, is the abundance of mosquitoes. Dr. Miyajima, who has made a careful study of the subject, states that but one variety of anopheles occurs in Japan, and it is capable of conveying but one type of malaria, the simple tertian. Consequently, quartan and estivo-autumnal malaria do not occur. Tertian, however, is common, and such infections as are transmitted by other genera of mosquitoes apparently have numerous opportunities to spread.

The abundant water supply of Japan, the numerous fish-ponds, irrigating ditches and rice fields, and the general lack of sewerage afford the mosquitoes ample breeding places and make the mosquito problem almost or quite insoluble.

The third great factor which strikes the observer as necessarily influencing the public health is the common bath. Our personal experiences with this institution was limited to three inns in which we stopped. In them the bath consists of a cedar tub a little larger than a half barrel, through which runs an iron pipe or chimney leading from a charcoal fire beneath the edge of the tub. The tub being filled with cold water, a fire is started below and the water heated. The bath is used as follows: Beginning with the first arrival or the principal guest, all the persons in the inn soak and rinse themselves in that water. The soaping and scrubbing are done outside, so that the water preserves a fairly clean appearance, but each body must contribute a share of dead epithelium, hair and micro-organisms, so after a dozen or more bathers have used it, it may fairly be called unclean. Japanese physicians with whom we have discussed this question contend that the bath is not a source of danger and that the frequent bathing of the Japanese protects them from skin infections, and that Japan has fewer varieties of skin diseases than any other country.

It is possible that the varieties of skin diseases are fewer in Japan than elsewhere, but we think that the number of cases is not exceeded anywhere. In no place that we have been, including the Philippine Islands and Canton, were skin diseases so much in evidence as in Japan. On the streets, in shops, in railway coaches, on the farms, in factories, everywhere that we visited, skin diseases were seen. Impetigo and ringworm, especially *Tinea tonsurans*, were most abundant, but other varieties were not lacking.

We could not but believe that the common bath has much to do with the diffusion of these diseases. The general cleanliness of the people, their homes, their clothing and their methods of work indicate that such diseases are not usually transmitted in the same way as in other countries.—*Military Surgeon.*

REMARKS ON RAILROAD SURGERY.

J. M. PARROT, M. D., KINGSTON, N. C.

To my mind the most important general fact in railroad surgery to be remembered, is that it is in a class to itself, and is a special branch of surgery. The railroad surgeon who realizes this succeeds best. General surgical principles, for example, asepsis, etc., apply. So they do to ophthalmic surgery, though the minutiæ of eye surgery places it in a class to itself, as they do with railroad surgery.

To be sure a simple fracture is a general surgical lesion and is to be treated in the same manner regardless of its causative factor, but

these simple general surgical injuries form but a small part of the railroad surgeon's work.

A contusion produced by heavy machinery is often more destructive ultimately, than one caused by a lighter implement. Shock to the trophic nerves, while not apparent at times microscopically, is generally causative of a destructive gangrene, which may necessitate an amputation, or other extensive surgical work.

Several years ago I was called to attend Mr. A., a young man whose tarsus had been contused in a railroad accident. The injury on casual inspection seemed to be rather simple and superficial, close examination revealed dislocation and fracture of two tarsal bones, and apparently not very much injury to the soft parts. It did not occur to me that there was the least danger of the loss of the limb; in a few days, however, gangrene and other symptoms developed which necessitated the removal of the limb. In this case, while there was a decided infection, all ultimate danger could not be explained by this. Without doubt, shock to the immediate tissues, destroying the forms of the cells, played a most important rôle.

We have noted time and again the fact that contused wounds which were but slightly lacerated suppurate more freely than incised ones. So in this case and for the reason mentioned, solutions which are too strong have sometimes a destructive effect on the tissues.

While thus developed, so to speak, the tissues resist infection but feebly, if at all and it is particularly important that the local circulation be kept at its best and the most rigid asepsis practiced. To accomplish this the local circulation must be encouraged by limb elevation, thorough and complete, enveloping the extremity in large amounts of absorbent cotton, to promote warmth, rather loose bandaging, systemic stimulants and tonics and the free use of large quantities of hot sterile water maintaining a minimum amount of chemicals (antiseptics).

In all contusions, even though apparently simple, the utmost precaution should be exercised along the lines suggested, that infection be prevented with an early and prompt restoration of tissues to their normal condition. The wise surgeon will watch all railroad contusions carefully, and will exercise the utmost and especial precaution to prevent infection and to encourage local nutrition.

Not only do local shocks lower the vitality of tissue immediate to the injury but often times produces nerve manifestations of a general and clear character. Injuries of this kind are oftentimes followed by prolonged and aggravating neurotic symptoms.

Sometime ago I called to see Mr. B., who was thrown from a hand car. He sustained a fracture (simple), of two ribs and sprained ankle and an apparently slight contusion of the back. The first two injuries yielded to treatment promptly, severe pain continued in the lumbar region and ere long the patient developed a pronounced train of symptoms usually classed under the caption "traumatic neurasthenia." A prolonged rest treatment together with massage, etc., will effect a cure as they have done in many other cases. The mind of these patients plays an important rôle in the disease and is in my opinion, in many cases, somewhat at fault. It is absurd to say these are malingerers or hysterics. They are not, and can only be completely cured when they are taught to forget themselves.

The prognosis in railroad injuries to the spine or vertebral region should always be guarded and all such cases handled with the utmost care.

The management of shock in railroad injuries, taxes the skill of the surgeon. Stimulation should be systematic and must not be overdone, heat and rest are important and the general surgical rules governing such cases should prevail, especial care being exercised to guard against reaction. My personal experience has led me to condemn digitalis in such cases and I am not very fond of using the vasodilators, such as nitro-glycerin, except in rare instances where especially indicated by the given symptoms. I prefer the simple nerve stimulants and those which have especial action on the heart fibres and ganglia. The vasoconstrictors put extra work on an already shock-weakened heart and the vasodilators nerves, if such there be, usually over stimulated in shock, and hence there is no need for further stimula-

tion. I prefer ammonia, strychnin, atropin, heat and of all the most important, rest, in the treatment of railroad shock.

The question when to amputate and where, has perplexed the profession for time. For my part, when in doubt, I did not amputate, so the puzzling question with me is when to be in doubt. This must be answered at the bedside after considering all the points in the individual, and it cannot be settled in a didactic or in a general way.

One should never be in too great a hurry to amputate. Where to amputate cannot be determined except by the condition of the individual case and as in answering, when, the patient should be given the benefit of the doubt.

Drainage is an important and ever recurring proposition in railroad surgery. Almost every case requires more or less. The majority of injuries occur to those who are already soiled with dirt and grease. This renders aseptic preparation of the parts very difficult, even under the most favorable circumstances. A drain is preferable to all others and should be removed as early as possible, the time for removal being judged by local and general conditions. When in doubt, drain temporarily, loosely, but thickly applied temporary dressings should be used more frequently than is sometimes done. This renders frequent inspection easy, and promotes drainage.

In preparing a lacerated contused wound, covered with oil and grease, large quantities of water containing potash soap cannot be improved upon, in fact for cleansing purposes it is indispensable. It would precede bichlorid. Strong solutions of antiseptics should best not be used. Above all, especially carbolic acid increases the danger of the local infection in tissue, already greatly devitalized. A word of warning along this line is needed. In conclusion permit me to say that emergency drugs should be provided and kept on all trains along the lines as employed in the field by the soldiers, but modified to meet the demands of the railroad surgeon. It would be beneficial if engineers, flagmen, brakemen and conductors were instructed in the simple rules governing the management of the injured, transportation, care of wounds temporarily, and especially impressed with what not to do.—*Carolina Medical Journal.*

A METHOD OF AMPUTATION AT THE ANKLE-JOINT WHICH LEAVES THE HEEL INTACT.

C. GORDON WATSON, F. R. C. S. LONDON, ENG.

The method here given was made use of in two cases for long-standing talipes equino-varus, with equinus predominating. In both cases the deformity had been untreated in the past and owing to the stretched and enfeebled condition of the extensors and the shortened and contracted condition of the flexors offered little chance of improvement without relapse, so long as an ankle-joint remained, which would allow the flexors again to overpower the extensors. The operation resembles in many respects le Fort's modification of Pirogoff's operation and may be termed "trans-calcaneal amputation of the foot."

Details of the Operation.—For the anterior flap 3 points are taken: ½-inch below and ½-inch behind the tip of the internal malleolus, ¼ inch below the tip of the external malleolus, and 1½ inches below the mid-point of a line joining the tips of the malleoli across the dorsum. A semilunar flap is cut joining these three points. The plantar flap is then cut by an incision dividing skin only, which extends from the inner extremity of the anterior flap downward and forward to ½ inch in front of the prominence of the tubercle of the scaphoid, then transversely across the sole to ½ inch in front of the prominence of the base of the fifth metatarsal, and then straight back to the outer extremity of the anterior flap. The anterior flap is then dissected up, the extensor tendons divided, the anterior tibial and musculo-cutaneous nerves cut short, and the dorsalis pedis artery ligated. The ankle is then opened from the front and the foot is forcibly depressed, the internal lateral ligament is severed from its attachments to the astragalus, with the edge of the knife held close to the bone, and the anterior and middle fasciculi of the external lateral are similarly dealt with; then with the foot inverted

the knife is passed from without between the os calcis and astragalus and the interosseous ligament divided. The astragalo-scaphoid joint is now opened and the head of the astragalus freed from the scaphoid. The body of the astragalus is next seized with iron forceps and twisted round so as to detach it from the posterior fasciculus of the external lateral ligament and the posterior ligament and so removed.

The next step is tenotomy of the tendo Achillis and all contracted fibrous tissue around it, taking great care to avoid the posterior tibial vessels and nerve. It will then be seen the os calcis can be brought up to the lower surface of the tibia, except for the projection of the sustentaculum tali which comes into contact with the internal malleolus. With a broad gouge the cartilage is then removed from the lower surface of the tibia, working from within out so the gouge is checked against the internal surface of the external malleolus, and then the malleoli are cleared of cartilage and the posterior inferior tibio-fibular ligament removed. Next, with the foot well depressed and pulled forwards, the upper articular surface of the os calcis is cleared of cartilage either by sawing off a thin slice with a fine saw or with a gouge. Owing to the slope of this surface it is necessary to take a little bone as well from the posterior part of this surface. The sinus pedis is then cleared of all fibres of the interosseous ligament and extensor brevis digitorum. Then so much of the sustentaculum tali is cut obliquely as will allow the os calcis to fit into the hollow between the malleoli.

Up to this point the front of the foot has been left articulated to the os calcis for purposes of manipulaion. The os calcis is now disarticulated from the cuboid and the separation of the foot is completed by cutting obliquely through the soft tissues of the sole to the margin of the skin flap already marked out. Before fixing the os calcis to the tibia the plantar vessels are tied, the plantar nerves are cut short, the tourniquet is removed, and all bleeding points are secured. About ¼-inch of the anterior extremity of the os calcis is then removed and the os calcis is brought into apposition with the tibia and fixed there with a 6-inch excision pin driven through the sole with about 2 inches left projecting. A second pin may be used and passed through the tibia into the os calcis from the front and tension subsequently—i. e., after suture and dressing—kept up on the projecting ends by rubber tubing passed in figure-of-eight round them. After suture of the flaps the stump is put up preferably in plaster for a fortnight, when the stitches and pins may be removed. Plaster is then re-applied and the patient is allowed to get about with the leg fixed on a peg leg. Plaster should be continued until firm bony union has occurred and the patient should not be allowed to put the foot to the ground under three months, but should continue to use the peg leg. At the end of three months an artificial foot can be fitted and gradually made use of.

Remarks.—1. It will be found that with the incision given the margin of the plantar incision will be 1 to 2 inches longer than the margin of the dorsal, so in suturing slight puckering of the plantar flap will be necessary. Any attempt at lengthening the anterior flap at the expense of the plantar offers two disadvantages—danger of sloughing in the dorsal flap, which consists only of skin and is not too well supplied with blood, especially in paralytic limbs, and also a risk of getting the ultimate scar too near the sole. 2. At the completion of the operation the plane of the sole remaining will not be horizontal but tilted forwards and upwards at an angle which corresponds to the position of the os calcis and sole in the normal foot. 3. The tendo Achillis having been divided there is no likelihood of the os calcis becoming displaced back and lateral displacement is prevented by retaining the malleoli. It is important to remove all cartilage and to get accurate adaptation of the bony surfaces before fixing. 4. The results of the two cases reported offer encouragement to repeat the operation in similar cases. The resulting stump is certainly as good as, if not better than, that produced by any other known amputation at the ankle. The operation should be applicable also to some cases of disease and injury in which it is possible to leave the os calcis.—*Lancet.*

Notices and Reviews.

"The Pancreas: Its Surgery and Pathology." By A. W. Mayo Robson, D. Sc. (Leeds), F. R. C. S. (Eng.) of London, and P. J. Cammidge, M. D. (Eng.) D. P. H. (Camb). of London. Octavo, fully illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co., 1907. Cloth, $5.00 net; Half Morocco, $6.50 net.

In this volume of 456 pages the authors present in a comprehensive and lucid manner a review of the present state of knowledge of the pancreas, its diseases, their relations to other local and general disorders, and its therapeutics, especially from the surgical standpoint, in which field the wide experience of the authors constitutes them authorities.

To show the comprehensive scope of the work a glance at the table of contents is sufficient; the chapters are as follows: Comparative Anatomy, Anatomy, Embryology, Anatomical Anomalies, Surgical Anatomy, Histology, Physiology. Pathology, Fat Necrosis, Chemical Pathology, Diabetes, General Symptomatology and Diagnosis, Injuries, Inflammatory Affections of the Pancreas, Acute and Subacute Pancreatitis, Chronic Pancreatitis, Pancreolithic Catarrh and Pancreatic Calculi, Pancreatic Cysts, Neoplasms. A very full bibliography appended to each chapter, and a list of authors quoted in the work, at the end of the volume, will serve as a valuable aid in looking up other literature on the subject.

Throughout the work a simple lucid style is maintained, every chapter is pregnant with interest, the mechanical part of the publication is of the best, paper and type superb, and numerous good illustrations are interspersed. Altogether the book is one which it is a pleasure to recommend to every member of the profession with the assurance that they will find enjoyment in perusing its pages.

H. Reineking.

"The Treatment of Fractures: With Notes Upon a Few Common Dislocations." By Chas. L. Scudder, M. D., Surgeon to the Massachusetts General Hospital. Sixth Edition, Revised and Enlarged. Octavo, 635 pages, with 854 original illustrations. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co., 1907. Polished Buckram, $5.50 net; Half Morocco, $7.00 net.

This work has become so well known, it is merely necessary to chronicle the changes in the new edition. The original purpose of the book was the presentation in concise and illustrated form of efficient means of treating common fractures. This has been constantly in mind in preparing the present edition.

The advisability of operating on certain fractures is considered at some length, and a few operative procedures described. Attention has been directed especially to obstetric fractures, to fractures of the zygoma, of the malar bone, of the neck and head of the radius and of the femoral neck. Also to the remote results following head injuries and pathologic fractures.

In the section on "Dislocations" accounts have been added of acromio-clavicular dislocations and unreduced dislocations of the elbow. Finally many new illustrations and x-ray pictures have been added, and the more important recent papers quoted.

"Atlas and Text-Book of Human Anatomy." By Prof. J. Sobotta, of Wurzburg. Edited, with additions, by J. Playfair McMurrich, A. M., Ph. D., Professor of Anatomy at the University of Toronto, Canada. 3 Volumes, 4to. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co. 1906-7. Price per volume, Cloth, $6.00 net; Half Morocco, $7.50 net.

The third volume of this magnificent atlas has just appeared. The division of subjects is as follows: Vol. I, Bones, Ligaments, Joints and Muscles, 258 pages with 320 illustrations, mostly in colors. Vol. II, The Viscera, including the Heart, 194 pages, 214 illustrations, mostly in colors. Vol. III, Vascular System, Nerves, Organs of Special Sense, 342 pages, 297 illustrations, mostly in colors.

The text is short and subordinate to the plates. Additions have been made from time to time by the American editor. As for the plates, suffice it to say this is one of the Lehmann "Hand-Atlases," which are renowned for the beauty and accuracy of their coloring. There are numerous cross sections and other illustrations showing the relations of the parts, though the work is not strictly a topographic anatomy, but a descriptive one. The size of the plates is such that in many instances the structures are portrayed the size of life. Next to actual work in the dissecting room there is nothing so satisfactory as glancing over a well-

drawn illustration. Where in addition, the parts are shown in the natural colors as in the work under consideration, there is a constant temptation to neglect actual dissection for inspection of the beautiful pictures. We know of no better treatise for any one wishing to refresh his memory preparatory to operative or other work on the body.

"The Physician's Visiting List (Lindsay & Blakiston's) for 1908." Philadelphia: P. Blakiston's Son & Co. Various Styles, $1.00 to $2.25.

All the features which have made this list so popular for over half a century are retained. The dose-table has been revised in accordance with the U. S. P. (1905).

BLAKISTON'S ? QUIZ COMPENDS?

"Compend of Surgery for Students and Physicians, Including Minor Surgery and a Complete Section on Bandaging." By Orville S. Horwitz, B. S., M. D. Sixth Edition, Revised and Enlarged. One Hundred and Ninety-five Illustrations and One Hundred and Four Formulæ. Philadelphia: P. Blakiston's Son & Co. 1907. 12mo. Cloth, $1.00 net.

This member of the brown-covered compend series has always been deservedly popular with students. It gives—considering the limitations of space—a fairly complete account of the salient points of surgery. The author has entrusted the present revision to an associate, and it could have been improved on. For instance, Senn's bone-plates now relegated to the limbo of obscurity are pictured and their use described, while Murphy's button in every day use is merely referred to. Petit's tourniquet is illustrated, but there is no picture of Esmarch's constrictor.

The author has become a urologist since the first edition of the little book, and considerable space, perhaps an undue amount is allotted to the diseases embraced in this specialty. It seems as if too much space also is given to purely operative details. No doubt a volume of the present size devoted to general surgery alone, with a similar one on operative surgery would be more satisfactory.

We are becoming positively fatigued with the picture of the bald-headed old gentleman with a full-dress suit and neckerchief engaged in reducing a dislocation of the shoulder. This has done duty for about a hundred years and should be given a rest.

"Cosmetic Surgery, the Correction of Featural Imperfections." By Charles C. Miller, M. D., Including the Description of a Variety of Operations for Improving the Appearance of the Face. Chicago: Published by the Author, 70 State street. 136 pages; 73 illustrations. 12mo, Cloth, $1.50 prepaid.

There is no doubt, as the author states, that the correction of facial deformities could be carried out by the surgeon as well, if not better, than by the charlatan to whom it generally falls.

The measures alluded to embrace eradication of wrinkles, etc. Some of them, for instance the correction of projecting auricles would seem to be feasible; others like the eradication of wrinkles do not strike us as successful or at least permanent.

The print is fair, but the cuts are very crude and should be improved on.

International Clinics—A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles, Edited by W. T. Longcope M. D. Philadelphia: J. B. Lippincott Co., 1907. Seventeenth Series, Vol. IV. Price per volume, $2.00 net.

The first paper by Henry of Philadelphia on "Treatment of Tetanus by Magnesium Sulphate," gives details of 4 cases with 1 recovery.

An elaborately illustrated paper on "Gastroptosis from the Radiographic Standpoint," is contributed by H. K. Pancoast of Philadelphia. R. G. LeConte of the same city narrates an unusual case in which an undescended testis situated retroperitoneally, was invaded by sarcoma and at the same time became strangulated by a twist. In addition to all this the swelling was located in the right iliac fossa, where it would be mistaken for appendicitis. In fact the diagnosis was "diffuse peritonitis of appendiceal origin." The tumor was removed with operative recovery.

H. P. Sights describes and figures a suspension apparatus for fracture of the femur, which he claims is better than plaster casts and Buck's extension. He gives details of 2 cases in which he used it with good results in patients of 64 and 78 respectively.

The volume, as usual, includes lectures and special articles on other branches—gynecology, urology, internal medicine, etc.

Personal

Dr. C. F. Rutledge, local surgeon for the Rock Island System at Alva, Okla., died recently.

Dr. D. S. Booth of St. Louis, Mo., neurologist for the Missouri Pacific, announces the removal of his office to Suite 426-431 Metropolitan building.

Dr. Guy Cochran, who has for some years been assistant chief surgeon of the Salt Lake railroad, was on January 1 appointed chief surgeon, with headquarters in Los Angeles.

Dr. A. B. Brumbaugh died at the hospital of Dr. Price, Philadelphia, on January 27, from an operation for appendicitis, after an illness of but four days, aged 71 years, 5 months and 17 days.

Dr. Andrew Boelus Brumbaugh was born in Penn township, Huntington Co., Pa., August 9, 1836. His early training was academic, not collegiate, but by private study and earnest application he became a thorough master of the classics and sciences and thus fitted himself well for that large sphere in life to which ambition and destiny led him.

At the age of 26 he began the study of medicine with Dr. J. H. Wintrode of Marklesburg, and in a year entered the University of Pennsylvania, where he graduated in medicine in 1866. He located in Huntingdon at once, and here for 42 years he has been going in and out of the homes of our people, ministering alike to rich and poor, high and low, and winning fresh laurels year after year, both for his well rounded ability and the persevering industry he displayed in his professional life. He was equally successful in the dual relation of physician and surgeon, which is uncommon, and it is difficult from a hurried contemplation of his career to determine in which branch of his work he excelled. It is enough, however, to say that he was successful in both.

No doctor in this section of the state was a closer student and investigator than Dr. Brumbaugh. Though advanced in years, he was modern and up-to-date in his work, the natural sequence of his close alliance with the medical societies of the state and nation, whose meetings he regularly attended. He was identified with the Huntingdon County Medical Society, which he helped to organize in 1872; member of the State Medical Society; the American Medical Association; the American Association of Railway Surgeons. He was a member of the pension examining board for nearly 30 years, and at the time of his death was the surgeon of the Pennsylvania and Broad Top railroads at this point. He was the county inspector of the State Board of Health and a member of the local board. He was a physician at the Orphans' Home for 27 years, and the bigness of his heart is revealed from the fact that he served without any compensation whatever. He was one of the founders of Juniata College, a trustee ever since its organization, and edited its paper, *The Echo*. As such he was eligible to membership of the State Editorial Association, in which he was active for many years.

On October 11, 1859, Dr. Brumbaugh was married to Maria B. Frank, who survives, with two children: Dr. Gaius M. Brumbaugh of Washington, D. C., and Cora, wife of A. P. Silverthorn of Coalport, Clearfield county.

At a special meeting of the Huntingdon County Medical Society, held January 29, the following was ordered to be placed upon the minutes:

In the death of Dr. Andrew B. Brumbaugh, who was one of the founders and a member of the society since April 9, 1872, and its secretary for many years, this society has sustained a great loss. He was rarely absent from its meetings and was always willing to use his rich fund of experience and ripe judgment in promoting the interests of the society and maintaining its dignity and honor.

For forty-two years, by day and by night, in sunshine and storm, he devoted his talents to the people of this community and ministered with great medical and surgical skill to alleviate their sickness and suffering.

We extend to the bereaved family our sincere sympathy in their sorrow and loss, knowing that although his place cannot be filled, their and our remembrances of him will be one who in all his relations in life, both public and private, was the embodiment of loyalty and devotion.—Huntingdon *Globe*, January 30, 1908.

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(Awarded Gold Medal (Highest Award) Lewis & Clark Centennial Exposition, Portland, 1905; Awarded Gold Medal (Highest Award) Louisiana Purchase Exposition, St. Louis, 1904; Awarded Bronze Medal (Highest Award) Exposition Universelle de 1900, Paris.)

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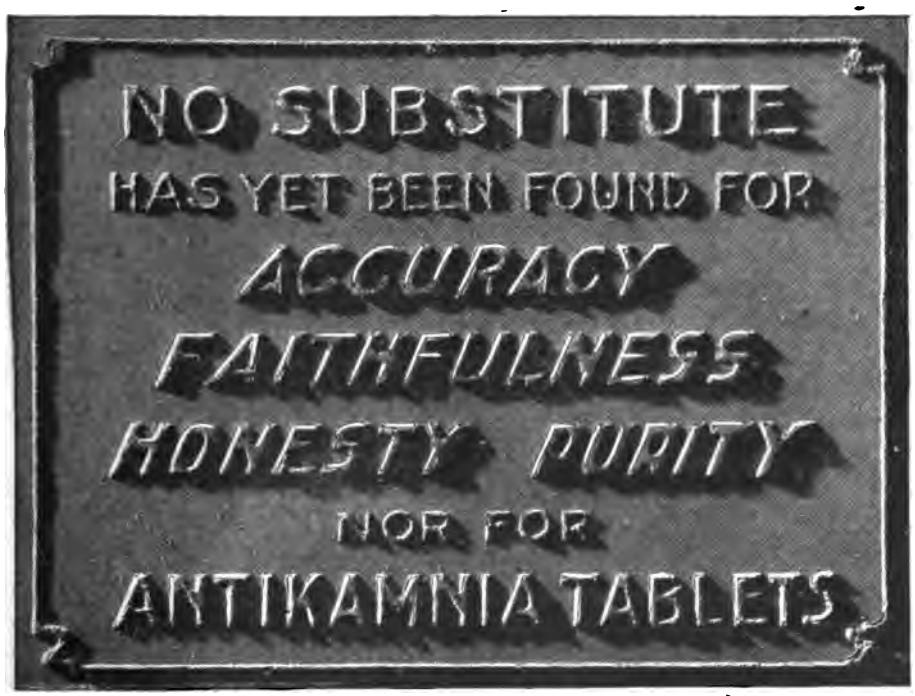

"Antikamnia & Codeine Tablets" in Grippal Conditions

PUBLISHER'S DEPARTMENT

A USEFUL TONIC.

The season is now on us in which we find many patients suffering from coughs and colds. In many of these cases the general system is below par, and in order to hasten recovery from the catarrhal conditions of the air passages a general tonic is indicated. Cod liver oil is a century old remedy for coughs and where the stomach can handle it there exists no reason why it should not be employed, and in such cases the results are satisfactory. But in many of these sufferers digestion is enfeebled, the appetite is poor and cod liver oil is not well borne. Fortunately for patient and doctor, modern pharmacology has provided a preparation of this valuable agent which contains "all of the oil except the grease," to which has been added the hypophosphites, with glycerin and agreeable aromatics. It is not only wonderfully efficacious but pleasant to the taste and readily handled by the weakest stomach. We allude to the well known Hagee's Cordial of the Extract of Cod Liver Oil Comp., prepared by Katharmon Chemical Co., St. Louis, Mo.—*The Carolina Medical Journal.*

A CONTRIBUTION TO THE TREATMENT OF GONORRHEA WITH ARHOVIN.

DR. M. WEINBERG, VIENNA, AUSTRIA.

Since he and Brings, some three years ago, jointly published their experiences with Arhovin, Weinberg has made continued use of the remedy and the favorable verdict which he now again renders therefore carries with it especial weight.

His observations signally demonstrate the fact that it is certain in effectiveness and, moreover, has the merit of never causing irritative reaction on the part of any organ—a claim which cannot be made for any of the balsams. For even the new and improved balsamics are not altogether free from disagreeable actions on the stomach, intestines and kidneys. On the other hand, not one such instances is reported in the entire literature of arhovin, despite the large number of recorded cases. This fact is of such importance that, even if it were only equal in efficacy to the other medicaments, arhovin is far preferable.

Weinberg also finds arhovin possessed of most remarkable analgesic properties—a fact which he ascribes to the promptness with which it is absorbed. He always noted that even severe pain ceased within two days after its administration, and often on the same day. The astonishing regularity of this effect can only be explained on the ground that arhovin, which is rapidly eliminated, anesthetizes the genito-urinary organs and arrests the inflammatory processes.

Weinberg places the dose somewhat above the average, giving in severe cases 10 of the 4-grain capsules daily. He attributes his excellent results partly to this increased dosage, from which he never saw untoward effects.—*Wiener medizinische Presse,* No. 44, 1907.

C. D. F. Phillips, M. D., London, (late lecturer on Materia Medica at Westminster Hospital and examiner in Aberdeen University), writing on "The Physiologic Actions and Therapeutic Uses of Phosphorus and Some of its Compounds," says the glycerophosphates are now extensively employed and appear to have a distinct sphere of usefulness. Discovered in the yolk of egg in 1846, they were but little known till 1893, when Robin drew attention to the large amount of partly oxidized phosphorus in the form of glycerophosphoric acid eliminated in the urine of some neurasthenics. He administered compounds of this acid and found they increase the general metabolism of both organic and inorganic matter, principally the latter, as shown by the augmented excretion of urea, chlorids and sulphates, though not of uric acid or phosphates. They favor the current assimilation of albuminoid matters and

moderate denutrition of the nervous system, aiding its reconstruction by remaining in the body. They have a wide range of employment —chronic gout, diabetes, phthisis, Bright's and even Addison's disease with nutritive decay, to improve the vital powers rather than to directly combat such maladies; similarly, any nervous breakdown, as in the aged or after acute illness; chlorosis, rachitis; chronic dyspepsia, especially with lessened acidity (after appropriate treatment); and neuralgia, ataxia, sciatica, spermatorrhea and neurasthenia generally when marked by depression, headache and impaired mental and muscular strength. Robin said insomnia, palpitation and phenomena of excitement may be exaggerated (this is not Phillips' experience) and that the medication is not suitable in conditions of azoturia or when organic oxidations are above normal, or in mental disease or general paralysis. They are beneficial in muscular atrophy from various causes and in diphtheritic paralysis.

Harris pointed out that *a priori* it is probable that the glycerophosphates act as foods to the nervous system. They favor assimilation and metabolism. The best results are obtained in nervous exhaustion from overwork, in which they really have good effect.

Professor Wild, of Manchester, uses glycerophosphate of soda for weakness following influenza and for nervous exhaustion from overwork and Dreschfield finds it useful in many functional diseases.—*Medical Brief.*

HOME-MADE BUTTERMILK.

It is now within the power of every household to have an abundance of that refreshing and healthful summer (also winter) drink—buttermilk. To the present time no one knew of any source of buttermilk except from the butter-maker; but nowadays the butter-maker does his work so well that the buttermilk is entirely deprived of the delicious little grains of fat which add so much to its food qualities as well as to taste. True, buttermilk, made direct from fresh rich milk, within a few hours, of the finest flavor and taste, nutritious and more excellent than the article as originally known, can now be prepared in any kitchen. This is done by taking a quart of fresh, rich milk, adding a pinch of salt and about a half pint of hot water to raise the temperature to body heat, and lastly adding a tablet which contains a pure culture of lactic acid bacteria. Place all in a pitcher, cover with a napkin, and let stand for twenty to twenty-four hours at the ordinary temperature, and there is your perfect buttermilk. The tablets are made by Parke, Davis & Co., the pharmaceutical and chemical manufacturers of Detroit, Mich., and are called "Lactone," or buttermilk tablets.

On the farm, in the process of butter-making the cream is allowed to sour spontaneously and is then churned. The souring is the lactic acid fermentation caused by lactic acid bacteria or ferments. The difference between the new and old process is one of method and not result. In the old, the lactic fermentation is waited for and expected to occur spontaneously, with disappointment sometimes. In the new, the ferment in pure culture is directly planted in the milk, and the desired fermentation is secured without fail. In Bible days, spontaneous fermentation of dough was depended upon to leaven or lighten bread, and failure frequently attended the process, the dough putrefying instead of fermenting, and was then lost. Finally man learned to add yeast to the dough and not to depend upon spontaneous processes, with the result of always securing the right fermentation and making a better and more nutritious bread. This new buttermilk process is a like improvement.—*Monthly Bulletin Indiana State Board of Health,* June, 1907.

GLYCO-THYMOLINE AS AN ORO-NASAL AND GENERAL ANTISEPTIC.

DAVID WALSH, M. D., (EDIN.)
Senior Physician, Western Skin Hospital, London, W.

It is only by slow degrees that medical men as a profession are learning to realize the important part played by bacteria in the cavities of the nose and mouth. One sign of this appreciation may be found in the fact that washes and gargles for the mouth and throat are being more and more adopted in everyday prac-

tice. The systematic use of such applications, however, so far as the nostrils are concerned, is for the most part still confined to specialists. One reason for this comparative neglect of a simple method of treatment by general practitioners has, no doubt, hitherto lain in the difficulty of obtaining a safe, and at the same time an efficient antiseptic and cleansing fluid, for the mucous membrane in question.

Glyco-Thymoline was brought to my notice as an excellent lotion for nasal and oral cavity and washes. On due inquiry it was found to fulfil the two conditions usually recognized by medical men in the United Kingdom as vouching for the character, so to speak, of such a preparation. First its advertisements are accepted by our three leading medical journals, namely, *British Medical Journal, Lancet* and *Medical Press and Circular.* Secondly, its composition is not a secret, its formula being freely published. Under these circumstances I determined to try the effect of this preparation in a few suitable cases. As a general antiseptic fluid that does not coagulate albumen and is non-irritant, deodorant and practically non-poisonous, Glyco-Thymoline has clearly a wide range of usefulness. My own observations, however, have been practically confined to its use in the nose and mouth with results that have proved satisfactory in every instance, especially in acute coryza, pharyngitis, influenza and septic conditions of the mouth.

THE COUGHS FOLLOWING GRIP.

Dr. John McCarty (Louisville Medical College), in giving his personal experience with this condition, writes as follows: "Ten years ago I had the grip severely and every winter until 1902, my cough was almost intolerable. During January, 1902, I procured a supply of Antikamnia & Codein tablets and began taking them for my cough, which had distressed me all winter, and as they gave me prompt relief, I continued taking them with good results. Last fall I again ordered a supply of Antikamnia & Codein tablets and I have taken them regularly all winter and have coughed but very little. I take one tablet every three or four hours and one on retiring. They not only stop the cough, but make expectoration easy and satisfactory. The best results are obtained by allowing the tablet to dissolve slowly in the mouth before swallowing."

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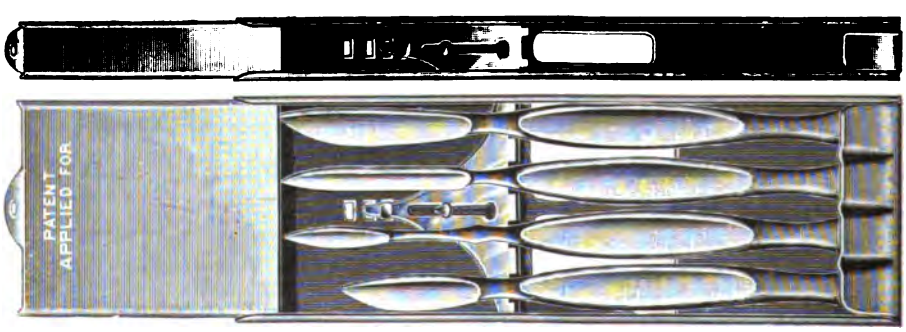

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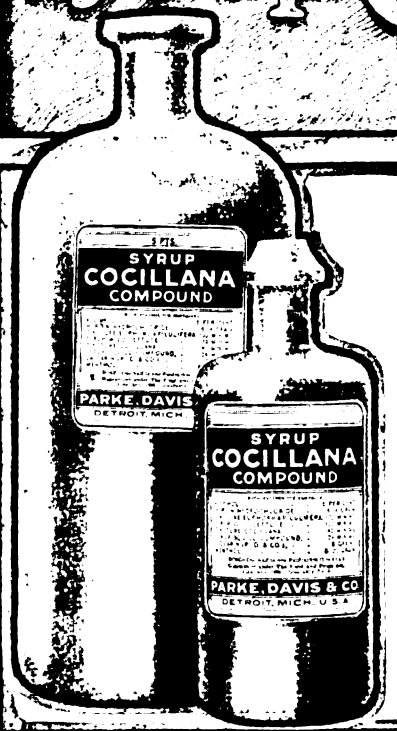

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Dose, ½ to 1 fluidrachm.

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The Railway Surgical Journal

Vol. XIV—No. 7 CHICAGO, MARCH, 1908 Whole Number 262

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THE Railway Surgical JOURNAL

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MINUTES OF FIRST ANNUAL MEETING JOINT ASSOCIATION OF RAILWAY SURGEONS—I. C., Y. & M. V. AND I. S. RAILROADS.

The first annual meeting of the Joint Surgical Association, I. C., Y. & M. V. and Indianapolis Southern Railroads, convened at the Hotel Gayoso, Memphis, Tenn, at 11 o'clock a. m., February 27, 1908, Dr. John E. Owens, Chief Surgeon, in the chair.

FEBRUARY 27—MORNING SESSION.

After a brief address of welcome by Dr. Owens, Dr. W. F. Grinstead, District Surgeon, Cairo, Ill., on behalf of the members of the Association presented Dr. Owens with a large silver punch bowl, suitably inscribed. The presentation address was as follows:

PRESENTATION TO DR. OWENS.

Gentlemen and Surgeons:—About a half century ago, the railroads of America began to spread out in the middle west and traverse sparsely settled country. Employes in large numbers were required to build track, operate trains and handle freight. The development of fertile valleys and prairies invited immigration, increased population, and increased the passenger traffic of the transportation companies. These conditions were inseparable from an increasing number of accidental injuries to employes and passengers. The sagacious, astute lieutenants who were sought by capitalists to manage this great and increasing traffic upon which the country must depend for the distribution and marketing of its products, were soon confronted with the very important problem of taking the best care of these personal injuries. They furthermore found the problem of seeking protection for themselves quite imperative. The laws of the land and the sentiment of juries gave rise to the malingerer and the ambulance lawyer.

Two motives prompted the railway people to consider seriously a surgical department: First, the instincts of humanity; secondly, self-preservation. The idea of a trunk line connecting the great lakes with the Gulf of Mexico was conceived. This materialized in the Illinois Central Railroad, which is today the great "aorta" of the Mississippi Valley. If a surgical department was established, a master surgeon must be placed at its head. This accomplishment, of itself, was not enough. The head of this department must be an executive officer. He must possess the ability to select, organize and direct an army of competent surgeons. He must secure the best talent along the lines of road. In casting about for this rare combination of the master surgeon and the wise and brave general, these captains of industry discovered Dr. John E. Owens. (Applause.) He possessed these talents so pre-eminently that he has commanded this distinguished army for near two score of years. That means that he is now in command of two generations of surgeons. The old generation love him more than the new, because the longer his men know him the better they love him. (Applause.) I believe I speak the truth when I say that the overwhelming majority of his men, who know him well,

would shoulder a gun for him if his personal safety required it. (Applause.)

The exigencies of trade and commerce in recent years have led the captains of industry to advise conciliation and friendly relations between employer and employe. Experience demonstrated that the manager who was considerate of the necessities and comfort of his men, and demanded just and fair treatment for them, was the most valuable man in the service. This manager, above all others, was called into conference when wrecks, strikes and other disasters threatened to clog the wheels of commerce. Good feeling between the men and their leaders came to be a most valuable business asset. When the directors of the great "aorta" came to suggest conciliation, as a business policy, to the chiefs of the departments, they found that this practice had grown old in the surgical department. It had not grown old as a business policy, but as a humanitarian principle which had emanated from the great, good heart of Dr. John E. Owens. (Applause.) His men were closely attached to him by a feeling that he was their friend, that he delighted to aid and accommodate them.

One of his fixed rules has been to secure the best men in the profession along the lines of the road. If he has not secured the very best, you may be assured that they are as good as the best. This fact makes me realize that I am looking into the faces today of the best surgeons in the Mississippi Valley.

Now, Dr. Owens (turning to Dr. Owens), these distinguished representatives of the healing art who have the honor to serve in the department of which you are the honorable chief, desire you to know that they recognize in you, not only a master and teacher of eminence in the science and art of surgery, but also the philanthropist. They feel that when their happiness has been made known to you, you have rejoiced with them. They believe you have sympathized with them, they believe that you have often been unhappy because you were unable to grant their every wish, that you have gone out of your way and sacrificed your own pleasure on many occasions to promote theirs. They know that your department is administered by kindness and not by intimidaton. Every soldier in this vast army of yours tries to render the very best service that he is capable of rendering, not alone for the benefit of his patient or his own benefit, but for the joy of having your approval and making your good heart glad.

As a token of their esteem and a remembrance of this occasion, also as a means of bringing good cheer to you when the burdens of life and years remind you of their weight, they have requested me to present you with this magnificent punch bowl. May it seldom be as dry as it is today. (Laughter and applause.)

Dr. Owens responded as follows:

Gentlemen, I hardly know how you can expect a man to reply when he is as full as a tick.

There is one inscription which I might have put on in addition to those that appear (and this is the only adverse criticism I could possibly make), namely: "A glass every few minutes till relieved." (Laughter and applause.) It is hard to speak. Had the punch bowl been full I'm sure I could have done ever so much better, but I most sincerely thank you all.

As has already been stated by Dr. Grinstead, those that I see before me are the best men in the towns from which they come. The selection of a local or district surgeon is a difficult thing, more so than it was some years ago. The demands made upon his ability, his shrewdness, his good judgment, have reached a high plane. After application for the position of railway surgeon is made we receive letters of recommendation from neighboring doctors, from officials of societies, from business men, as to the ability, the honesty, the integrity and good judgment of the man who applies for the place. We have those men before us today, and I am very grateful indeed for the expressions of friendship and for the sentiment contained in this beautiful and artistic gift. I am not able to express quite the appreciation which I feel on this occasion, and again thank you for your good wishes and your friendship of which this is the token.

I have just learned that I am to receive also a bound book of letters, not only the letters

which have been written in response to this call for the organization of our Association, but those called forth by the contemplated gift which you have made me today. Again I thank you. (Applause.)

The chairman announced that the first step in the organization of the Association was the appointment of a committee on organization. Motion was made, seconded and carried that the chairman appoint such committee, whereupon Drs. C. B. Fry, D. G. Murrell and W. F. Grinstead were appointed to act as Committee on Organization. A ten-minute recess was then taken to enable the committee to confer and formulate a report. Upon reconvening, Dr. Fry, chairman of the committee, read the following report:

REPORT OF COMMITTEE ON ORGANIZATION.

Name.—Joint Association of Railway Surgeons, I. C., Y. & M. V. and Indianapolis Southern Railroads.

Object.—1. The promotion of a better acquaintance among the members of the Surgical Staffs.

2. The preparation of papers and discussion of subjects of interest to the railway surgeon.

Officers.—President, First Vice-President, Second Vice-President, Secretary and Treasurer.

Election of Offices.—Officers shall be elected by ballot on the second day of each annual meeting for one year.

Executive Committee.—In addition to the Chairman, the Executive Committee shall consist of five members, as follows: One member elected for 5 years, one for 4 years, one for 3 years, one for 2 years, and one for 1 year; then at each annual meeting, one member of the Committee shall be elected for five years. The Chief Surgeon shall be ex-officio Chairman of the Executive Committee.

Publication Committee.—This Committee shall consist of three members selected by the Executive Committee.

Membership.—All surgeons of the I. C., Y. & M. V. and I. S. are eligible for membership in the Association on the recommendation of two members. Members are elected by viva voce vote of the Association.

Dues.—Annual dues are One (1) Dollar, payable at each annual meeting. A member two years in arrears for dues becomes liable to suspension on the recommendation of the Executive Committee.

Upon motion made, seconded and carried, the report of the committee was adopted.

ELECTION OF OFFICERS.

Dr. Fry suggested that inasmuch as this is the first meeting held, officers be elected at this session. The following officers were then duly elected:

President—Dr. John E. Owens, Chief Surgeon, Chicago.

First Vice-President—Dr. D. G. Murrell, Assistant Chief Surgeon, Paducah, Ky.

Second Vice-President—Dr. Battle Malone, District Surgeon, Memphis, Tenn.

Secretary and Treasurer—Dr. C. B. Fry, District Surgeon, Mattoon, Ill.

Executive Committee:

For Five Years—Dr. Jas. H. Letcher, Henderson, Ky.

For Four Years—Dr. H. C. Fairbrother, East St. Louis.

For Three Years—Dr. E. J. Johnson, Yazoo City, Miss.

For Two Years—Dr. J. P. Lord, Omaha, Neb.

For One Year—Dr. I. F. Firebaugh, Robinson, Ill.

There being no further business before the Association, the reading of papers was called for. Dr. Letcher took the chair and Dr. Owens read the first paper on the program, entitled "Caisson Disease." Discussed by Dr. H. C. Fairbrother, Dr. W. H. Allport, Chicago; Dr. B. Malone, Dr. W. F. Grinstead and Dr. A. W. Rudisell, Dr. Owens closing the discussion.

Mr. C. N. Burch, General Solicitor Y. & M. V. R. R., by invitation gave an address on the subject of the "Relations of the Surgical Department and the Law Department," at the conclusion of which Dr. Owens moved that a rising vote of thanks be tendered Mr. Burch for his interesting discussion of the subject. Motion seconded and unanimously carried.

Upon motion the meeting was adjourned until 2:30 p. m.

AFTERNOON SESSION AT 2:30 P. M.

Meeting was called to order, Dr. Owens in the chair.

The first paper presented was by Mr. L. L. Losey, Chief Claim Agent, entitled "The Relations Between the Surgical and the Claims Departments of Railroad Companies." Discussed by Dr. H. C. Mitchell, Carbondale, Ill., and Dr. J. E. Owens. Motion made by Dr. J. L. Crook and duly seconded that a resolution of thanks be extended to Mr. Losey for his paper, so beautifully worded and carefully prepared. Unanimously carried.

Paper entitled "Fractures," Dr. C. B. Fry, Mattoon, Ill, was then read. No discussion.

Presentation of a case entitled "A Case of Double Amputation of Lower Leg with Unusual Features," was made by Dr. J. L. Crook, Jackson, Tenn. The subject was discussed by Drs. E. J. Johnson, D. G. Murrell, E. J. Waddey, J. E. Owens, J. P. Lord, J. L. Wiggins, Dr. Crook closing the discussion.

Dr. W. H. Allport, Assistant Chief Surgeon, Chicago, read a paper entitled "Certain Legal and Etiologic Aspects of Hernia and Allied Conditions." Discussed by Drs. E. J. Waddey, Waterloo, Iowa; C. F. Smith, Kankakee, Ill., and J. L. Wiggins, East St. Louis, Ill., Dr. Allport closing the discussion.

The next paper presented was by Dr. E. J. Waddey, Waterloo, Iowa, entitled, "Objective vs. Subjective Symptoms," which was discussed by Dr. L. C. Henley, Burnside, Ill.

The two papers entitled "Fractures of the Shaft of the Femur," by Dr. H. C. Mitchell, Carbondale, Ill., and "Fracture of the Leg, with Exhibition of Author's Loop Used in the Interrupted Plaster Cast," by Dr. J. P. Lord, Omaha, Neb., were read and discussed jointly by Dr. C. H. Linn, Kuttawa, Ky.; Dr. W. H. Wilder, Birmingham, Ala.; Dr. Ed. Doepp, Blue Island, Ill.; Dr. C. M. Pusey, Parkside, Ill.; Dr. W. Woodbridge, Central City, Iowa; Dr. W. E. Rice, Tuscola, Ill.; Dr. I. F. Firebaugh, Robinson, Ill.; Dr. H. C. Fairbrother, East St. Louis, Ill.; Dr. T. J. Shoemaker, Morganfield, Ky.; and Dr. J. E. Davis, Farmer City, Ill., Dr. Mitchell closing the discussion.

Upon motion meeting was adjourned to 9 a. m. Friday.

FEBRUARY 28, MORNING SESSION.

Meeting was called to order by President Owens.

Minutes of the two previous meetings were read and approved.

Motion was made by Dr. C. B. Fry that Mr. L. L. Losey, chief claim agent of the I. C. System, Chicago, be declared a member of the Association. Motion seconded and unanimously carried.

Motion made and seconded that the meeting place for next year be left to the selection of the Executive Committee. Carried.

Moved and seconded that a vote of thanks be tendered the management of the Gayoso Hotel for their courtesy in extending the use of the room in which the meetings of the Association have been held. Carried.

Dr. L. C. Henley, Burnside, Ill., then discussed the subject, "At What Stage and Under What Conditions Should an Injured Employe Be Permitted to Resume Work?" Discussed by Dr. D. T. Martin, Pomeroy, Iowa, and Dr. H. C. Mitchell, Dr. Henley closing.

Paper entitled, "Results in Treating Compound Comminuted Fractures," was read by Dr. D. G. Murrel, Assistant Chief Surgeon, Paducah, Ky. Discussed by Dr. W. F. Grinstead, Cairo, Ill.; Dr. R. E. Fort, Nashville, Tenn., Dr. L. Sexton, New Orleans; Dr. H. C. Fairbrother, East St. Louis, Ill.; Dr. J. R. Sanford, Covington, Tenn.; Dr. I. F. Firebaugh, Robinson, Ill.; and Dr. J. P. Lord, Omaha, and the discussion closed by the essayist.

The following report was read by Dr. H. C. Fairbrother, secretary of the Executive Committee:

That the proceedings of this Association be published in THE RAILWAY SURGICAL JOURNAL, and that the Committee on Publication be as follows: Dr. E. P. Cook, Mendota, Ill., Dr. W. F. Grinstead, Cairo, Ill., and Dr. E. J. Johnson, Yazoo City, Miss.

That the next place of meeting be Memphis, Tenn.

It was moved and seconded that the report of the committee be adopted. Carried.

Dr. Frank Allport, Chicago, read a paper entitled, "Trauma of the Eye-ball," which was discussed by Dr. F. C. Vandervort, Bloomington, Ill., Dr. J. L. Wiggins, Dr. D. T. Martin and Dr. D. G. Murrell, Dr. Allport closing.

Paper entitled, "Penetrating Wounds of the Abdomen," was read by Dr. B. Malone, Memphis, and discussed by Dr. W. H. Allport, Dr. R. E. Fort, Dr. C. F. Smith, Dr. J. L. Wiggins, and Dr. L. Sexton, Dr. Malone closing the discussion.

Upon motion, an adjournment was taken to 2 o'clock p. m.

AFTERNOON SESSION.

The meeting was called to order at 2 o'clock by President Owens.

Paper entitled, "Operations in Shock," was read by Dr. W. F. Grinstead, District Surgeon, Cairo, Ill., and discussed by Dr. E. J. Johnson, Dr. C. S. Stewart, Amite, La.; Dr. L. Sexton, New Orleans; Dr. C. F. Smith, Kankakee, Ill.; Dr. W. H. Wilder, Dr. O. A. Hall, Webster City, Iowa; Dr. G. F. Holland, Bloomington, Ind.; and Dr. I. F. Firebaugh, Dr. Grinstead closing the discussion.

Mr. L. L. Losey, in a brief address, expressed his appreciation of the action taken at the morning session in electing him a member of the Association.

Dr. E. J. Johnson, Yazoo City, Miss., read a paper entitled, "Compound Fractures of the Skull, with Report of Cases." Discussed by Dr. D. G. Murrell, the author closing the discussion.

Dr. L. Sexton, New Orleans, then read a paper entitled, "The Cause and Management of Infection." No discussion.

Paper entitled, "Operative Treatment of Fractures of the Clavicle," was read by Dr. Allen Staples, District Surgeon, Dubuque, Iowa. Discussed by Dr. C. H. Linn, Dr. T. D. Martin, Dr. I. F. Firebaugh and Dr. E. J. Johnson, and the discussion closed by Dr. Staples.

The last paper to be read was by Dr. R. E. Fort, Nashville, Tenn., entitled "(a) Depressed and Incarcerated Fracture of Ribs, (b) Inter-Scapulo-Thoracic Amputation, (c) Fracture of Patella-Method of Operating for and Presentation of Specimens." Discussed by Dr. E. J. Johnson, Dr. Allen Staples, Dr. J. P. Lord, and Dr. I. F. Firebaugh; Dr. Fort closing the discussion.

Dr. J. P. Lord moved that the names of honorably retired members of the surgical staff of the I. C. System be presented to the Executive Committee with a view to their being admitted to membership in this Association, that the matter be left in the hands of the Executive Committee and that it report at the next annual meeting the names of those who have joined, and that a resolution to this effect be adopted. Motion seconded and carried, whereupon the resolution was declared adopted.

Dr. Vandervort moved that Captain M. F. Jamar be given honorary membership in the Association. Seconded. Unanimously carried. Captain Jamar thanked the members for their courtesy in this action.

Dr. W. H. Wilder moved that the Secretary be instructed to have printed the constitution and by-laws, with a list of the membership of the Association, and that a copy be mailed to each member. Seconded and carried.

Dr. Owens: Let me say a word before we close. When the idea of organizing you gentlemen into an association was decided upon, it was hardly thought well to bring you so far simply for the purpose of organization, so we made an effort, about six weeks ago perhaps, to get up a program, and you see the result of it. I may be allowed to state that I am sincerely gratified at the splendid response that you have made to this call. The papers have been of high order, they have been well discussed, and yesterday I had a good many bouquets falling around me. I want before you get away to tell you that I am trying to feel worthy of your kindness, of your great courtesy. I have come to the truth of the matter and got at the basic principle of the whole thing, and that is that it lies in your loyalty, in the ability with which you have performed your duties, and it is my wish that you may long live and prosper and be happy. (Prolonged applause.)

The meeting then adjourned *sine die*.

CAISSON DISEASE, "THE BENDS," DIVER'S CRAMP.*

JOHN E. OWENS, M. D., CHICAGO,
Chief Surgeon Illinois Central and Chicago & North-Western Railways.

The first observation in caisson disease where compressed air for submarine work was applied, was made in 1820 by Dr. Hamil of Russia. In the course of the great engineering work done, diving bells were employed. Dr. Hamil took great interest in studying the effects of compressed air, not only upon the workmen, but also upon himself. In describing his own experience, he states that at the depth of 5 or 6 feet, severe pain was felt in the ears, which was relieved in a measure by swallowing. At 15 or 16 feet there was a noise in the ears like an explosion, followed by entire relief from pain. His respiration was perfectly easy. The ascent was accomplished with much less inconvenience than the descent. He states that one of the workmen became so accustomed to the air of the bell, as to be uncomfortable under the usual atmospheric pressure.[1]

In 1822, M. Triger devised an air-chamber or a shaft that was sunk near the river Loire, France, for the purpose of reaching coal underlying a quicksand 65 feet thick, and full of water percolating from the adjoining river.

The apparatus consisted of a steam engine, two air pumps and an air vessel. The air vessel had a stuffing-box fixed to its lower part, intended to connect it with a wrought-iron pipe, in such a way as to cut off all communication with the outer air. A supply pipe for the conveyance of compressed air from the pumps to the shaft, and an outlet pipe for the discharge of water, was added. Two man-hole valves, designed for passing men and material into and out of the air vessel, two air locks, a pressure gauge and a safety valve, completed the apparatus.

As early as 1825, Sir H. Davy studied the effects of air compression on the human body, considerable correspondence on it appeared in the medical press up to 1835. Many apparatuses were invented for the purpose of experimenting on the influence of artificial air pressure on the human body, principally by Theodore Junod, of Strassburg, Sir James Murray, Sir H. Davy and W. Reid Clanny.

J. Hughes, assistant engineer at the Rochester bridge, England, noted that the men at work in compressed air had a remarkable increase of appetite for food. Respiration, he said, was "slightly affected," and when the transit of the air-lock was rapidly made, there was some complaint of headache. The greatest depth under water was 61 feet.

M. Boinet reports 30 cases of accidents due to a too sudden decompression, 12 of them being fatal. He also mentions the deaths within one month of 2 coral fishers in the bay of Marseilles, in consequence of leaving the water too suddenly. The non-fatal cases are grouped into permanent and transient paralysis. There were 2 cases of permanent paraplegia, 3 cases of monoplegia of the lower extremities, 1 case of hemiplegia with aphasia, 4 cases of transitory paraplegia, 3 cases of hemiplegia with aphasia, 2 cases of facial paralysis, 3 cases of quadriplegia.

Boinet says that effusions of blood are habitually observed in caisson disease. He also assigns as a cause the formation of gas emboli in the vessels, due to a too sudden decompression. He quotes Lorraine Smith, who speaks of toxemia which is produced by the oxygen accumulated in the air under high pressure; but Boinet believes that the pressure in the caisson is not high enough for the oxygen to become toxic. Paul Bert attributes the condition to bubbles of gas in the capilliaries and the internal organs.[2] During the decompression he observed considerable spaces in the brain of a frog, and in the capillaries of the interdigital membrane.

*Read at first annual meeting Joint Association of Railway Surgeons of the I. C., Y. & M. V., and I. S. Railroads, Memphis, Tenn, February 27, 28, 1908.

1. *Tech. Archiv.*, St. Petersburg, 1821. (Ure's "Dictionary or Arts and Mnfg. of Mines," 1830.

2. London *Lancet*, 1835, Vol. II. *Academical Engineer*, 1850-1851.

This pathogenesis is plausible if we consider the good results of a slow decompression; also the good results of a slow decompression, and those of a gradual and immediate recompression, followed by a very slow decomposition in case of accidents.

Boinet further says that we must take in consideration the predisposing conditions of men employed in the kind of work under consideration of such as age (over 45), pulmonary affections, fatigue, alcoholism, a meal, especially when large, before the immersion. We must also take under consideration the depth of immersion and the rapidity of the decompression.

The divers should know of the two most important premonitory signals, viz., special pains, and temporary paralysis.

Of the 64 men employed in a caisson on the banks of the Loire in 1884, 16 had severe attacks, and it was necessary to discharge 25 on account of sickness. Two cases resulted fatally. Very often, when life is not lost, the ensuing paralysis is permanent.[3]

Albert Smith records the effect of high atmospheric pressure on the body, as follows:

1. The pitch of the voice is changed from a bass to a treble, and protracted conversation becomes very fatiguing.

2. The effects on the cutaneous vessels are shown by the pallor of the face, which is very marked, and continues for 15 or 20 minutes after leaving the caisson.

3. During the work in the Brooklyn bridge caisson, when the pressure was about 32 pounds, he took the temperature of 7 of the men an hour and a half after entering the caisson, and found that it averaged 99° F. At first he accepted this as a result of the increased interstitial change so strongly insisted upon by Dr. Jaminet of St. Louis, but subsequent observations led him to interpret it differently.

The temperature of the body in health is kept at about normal by constant evaporation from its surface, but in the caisson, as already mentioned, the air was already nearly or quite saturated with moisture, so that evaporation from the surface must have been practically suspended. With the temperature of the air at 76° F., as it was at the time of the observations, and the men engaged in severe labor, it is easy to see how the absence of the cooling process of evaporation from the surface would lead to a rise of 1 degree of temperature.

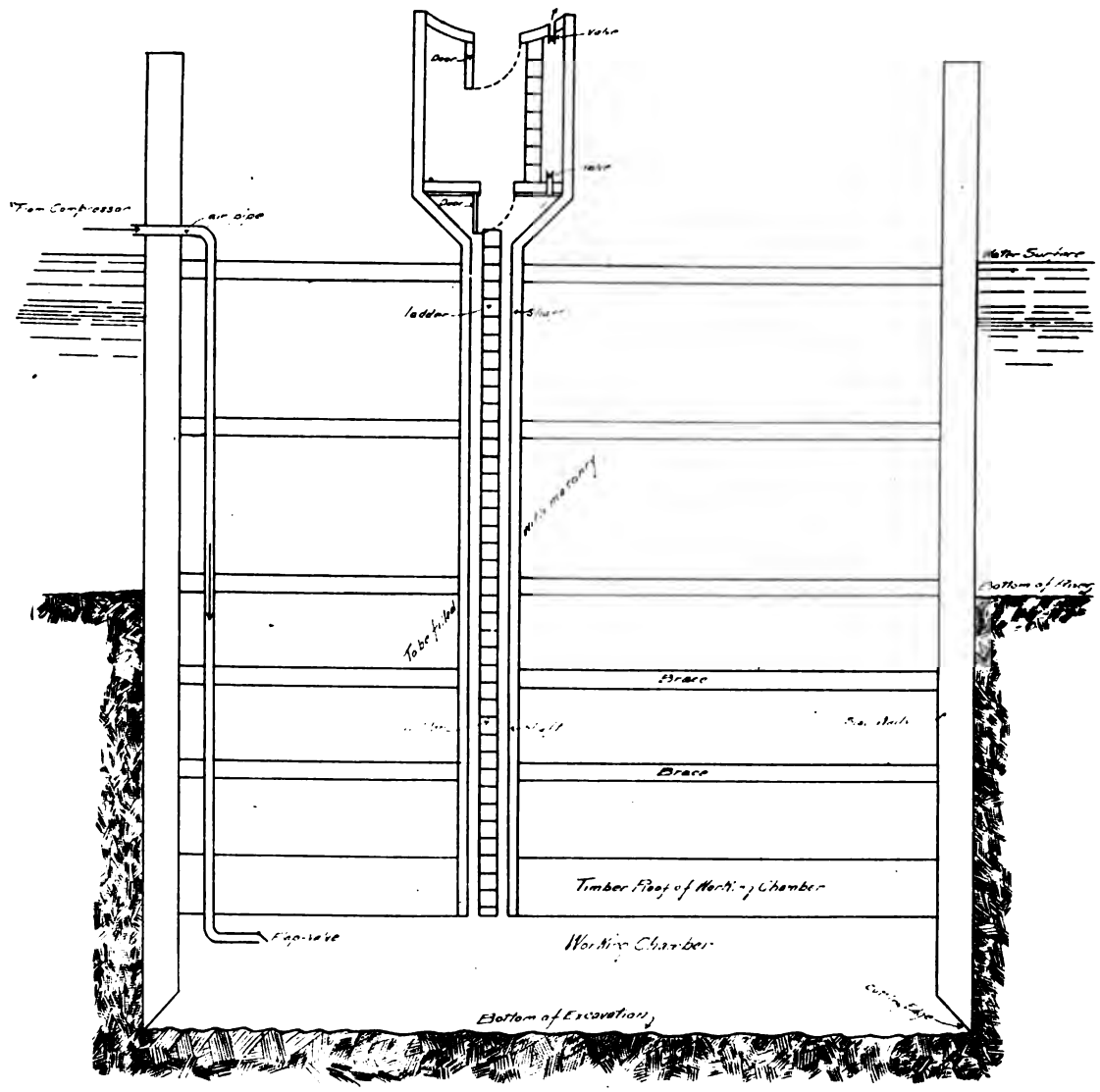
4. Circulation: Upon entering the caisson, the pulse immediately rises to 120, but gradually falls back to its normal standard, and sometimes below it.

The effect of high atmospheric pressure upon the volume of the pulse is always, according to his observation, to diminish it. This is easily accounted for by the pressure exerted upon the artery, which prevents its yielding readily to the expanding force of each successive wave of blood. Hence the pulse is small, hard and wiry.

5. Upon the Perspiratory Function: Several writers have observed that it is immediately remarked by every one entering a caisson that the secretion of the skin is apparently immensely increased, noticeable even when the temperature of the air is moderate, but as this increases it becomes a very serious annoyance. The clothing quickly becomes saturated, which, besides the discomfort it occasions, exposes the wearer to great danger of taking cold on going into the open air. But a little examination served to show that in the Brooklyn bridge caisson at least there was really no increase of the secretion from the skin, but, instead of evaporation, there was an accumulation of moisture, simulating excessive sweating upon the surface.

6. Upon Digestion: Nearly all authors who have written upon the effects of compressed air, agree that for a time at least it increases the appetite to a remarkable extent. Indeed, this is one of the first and most favorable results observed where compressed air is applied remedially. It was frequently remarked by the men working in the New York caisson of the Brooklyn bridge, that their work made them unusually hungry, and that they could not get enough to eat. Of course it was not possible to obtain

3. *Bulletin de l'Academie de Medecine*, 1906, p. 756.



Cross-Section Caisson Under Construction for C. & N.-W. Ry. Bridge, Chicago.

any exact data as to the relative amount of food consumed, but from careful inquiries it was considerably in excess of what is usual in the case of men engaged in similar labor in open air.

7. Upon the Urinary Secretions: Dr. Jaminet, in his observations at St. Louis, found that the amount of fluid secreted by the kidneys was very much increased, in some instances nearly doubled, while the specific gravity was little if at all below the usual average. This shows that the solid matter excreted was also in much greater quantity than usual. But the writer does not agree with him in attributing this exclusively to the excessive waste of tissue from over oxidation of the blood. The explanation is to be found chiefly in the fact that the skin, as already stated, performs its function very imperfectly, owing to the impossibility of evaporation from the surface, when the air is already loaded with moisture, and hence a portion of its duty is forced upon the kidneys—organs always ready to act vicariously for the skin and the mucous surfaces.

Corning has studied a number of cases of caisson disease in the workmen employed on the Hudson River tunnel. The most common symptom, and usually the initial one, was pain, followed by loss of power and anesthesia. These may continue and other symptoms develop, presenting the picture of acute myelitis, and cerebral symptoms may sometimes follow. The first ones are relieved if the patient at once returns to the caisson. The symptoms are considered to be due to the abrupt transition from an atmosphere of a high density to one relatively rarefied, as has been felt in aeronauts who ascended to great heights, who were immediately relieved when they descended to lower levels.

Corning advances no new theories in regard to the pathology of the disease. As regards treatment, he has employed morphin and electricity with benefit, but he believes the best remedy is to return the patient as quickly as possible to the compressed air, and thinks it advisable to have a chamber of compressed air in the neighborhood of the caisson for the treatment of the victims, and also that the process of locking out be made longer.

In 1861, Mr. Robert P, Brereton, an assistant engineer, engaged in the construction of the center pier of the Royal Albert bridge at Saltash, England, reported that during the time required for the installment of this pier, air-pressure reached 40 pounds above the normal; usually the pressure was much less, as the water in the main cylinder was kept down by pumps. He observed that at first his men worked too long at a time and on coming out they were slightly paralyzed, but in two or three days they recovered. With 3-hour shifts

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To Enter Caisson—

Bottom door of lock is closed. Men enter from top door and close it; then top valve being closed, bottom valve is opened, thus equalizing pressure. Bottom door is then opened and men go down ladder to working chamber.

To Leave Caisson—

Top door of lock is closed. Men come up ladder and enter lock through bottom door, and close door it. Then bottom valve being closed, top valve is opened, thus equalizing pressure. Top is then opened, and men climb out of lock into open air.

the men could continue to work for several months consecutively.

John Hawkshaw, the celebrated bridge builder, at the construction of the Londonderry bridge, where 75 feet pressure was experienced, noted some casualties, and that one of the effects produced by the air-pressure was that the joints of some of the less robust men began to swell.[4]

Oliver, of Newcastle (Eng.), describes an enormous caisson in which 35 men could work at the same time. The chamber was 45 meters long. He says the pressure in the caisson depends on the depth at which the work is done.

Oliver says that the early symptoms during compression are, as a rule, an unpleasant sensation in the ears or a deafness. Other symptoms may appear immediately after leaving, or several minutes or hours after.

The causes of caisson disease are attributed, in general, to too long a stay in the caisson, too high pressure, or to too rapid decompression. The less important symptoms are muscular pains, sometimes necessitating morphin hypodermically, bleeding from the nose or mouth, abdominal pains and vomiting. The grave symptoms are paraplegia, convulsions, and sometimes, though seldom, sudden death. Such elements as increase of the pressure, the degree of impurity of the air in the chamber or of that forced into it, duration of rest between hours of labor, the condition of health of employe, the rapidity of the decompression, contribute to the development of caisson disease. Oliver lays great importance on the factors of impure air, and rapidity of the decompression.

At the foundation of the Rochester bridge (Eng.) across the Medway, Dr. Hally experimented for the effects upon four other persons. They remained under water, at a depth of 10 fathoms, for an hour and a half, in a diving bell improved by his own ingenuity; nor was it considered that any limit existed as to the period they might have continued down with equal safety. A sharp pain in the ears, of short duration, was the only inconvenience acknowledged.[5]

In 1839, in the operation on the "Royal George," at Spithead, divers remained under water, at a depth of 90 feet, for half an hour, (*Proceedings of the Inst. of Civ. Eng.*, Vol. X, 1851.)

Dr. A. Jaminet has left a most interesting account of his experience.[6] He was employed by Mr. Eads, engineer of the construction of the Mississippi river bridge of St. Louis, to take charge of all the men at work in the air-chamber, and to establish such regulations as in his judgment the well-being of the men demanded. A floating hospital was established in a boat lying just below the pier. Besides ordinary accommodations, berths were fitted up in which workmen could lie down during their hours of rest.

Dr. Jaminet had been a frequent visitor to the air-chamber, and had himself felt the peculiar effects of compressed air. He had been much interested in testing the familiar law regulating the boiling point of liquids, when under pressure, and in noting the effect of the compressed air upon himself and those who entered the caisson with him.

He had noted the men as they came from the air-chamber. Their appearance was pallid and they were cold. In some the pulse was quick, varying from 95 to 110, but somewhat weak; with others it was as low as 60. Without exception the workmen complained of fatigue.

The pulse always quickened on entering the air-chamber, though it soon fell to the normal, and even lower, in the course of a watch. On one occasion the pressure was 32½ pounds more than that of the atmosphere. He recorded the pulse of himself and five other visitors as follows: Before entering, 81, 78, 78, 79, 79, 80. Temperature 56° of external

4. The effects of High Pressure, including Caisson Disease, Brooklyn, 1873. *Medical Record*, New York, 1890, May 10. *Proceedings Inst. Civ. Eng.*, Great Britain, Vol. XX.

5. *Le Bulletin Médical*, Paris, 1906, p. 437. *Minutes of Proc. of the Inst. Civ. Eng.*, Vol. X., 1850-51.

6. "Physical Effects of Compressed Air, and of the Causes of Pathological Symptoms Produced on Man by Increased Atmospheric Pressure Employed for the Sinking of Piers, in the Construction of the Illinois and St. Louis Bridge, Over the Mississippi River at St. Louis, Missouri." St. Louis, 1871.

air. They were 10 minutes in the air-lock. At the end of 6 minutes their pulses were 100, 88, 98, 86, 95, 90; thermometer 62°; temperature in air-chamber 48°. In 20 minutes all felt a marked exhilaration. At the end of two hours their pulses were 68, 70, 71, 69, 70, 72. Their chests expanded during inspiration normally. They spent 5½ minutes in the air-lock on their return, but they felt very cold. Thermometer fell to 37° in four minutes. Before ascending stairs, pulses stood 69, 70, 69, 71, 68, 72; after climbing the stairs, 106, 104, 92, 94, 102, 99.

On another occasion, Dr. Jaminet, three strangers and two workmen entered together. Pressure 37½ pounds; depth 81 feet. The pulse record was as follows:

Before entering	81, 75, 76, 80, 76, 82
On entering chamber.	97, 77, 77, 92, 88, 90
At end of two hours.	64, 70, 67, 69, 68, 68
On reaching top of pier	104, 90, 90, 100, 94, 96

In the air-chamber, the number of respirations increased from 18 to 21 per minute, and for a time at least there was a feeling of exhilaration. The workmen, without exception, sweat profusely throughout their stay in the air-chamber, though the thermometer was often below 60°.

The air-lock was, as a rule, excessively warm when the pressure was increasing, and exceedingly cold when the pressure was diminishing.

Dr. Jaminet always complained of cold in the air-lock, returning, and severe epigastric pain about 10 minutes after coming out.

On the day the caisson touched the rock (pressure 45 pounds) he remained in the chamber 2¾ hours. While in the air-chamber he felt well. In the air-lock, on his way out, he was conscious of a great loss of heat, and he suffered a violent pain in his head. The air was escaping very rapidly. The chief engineer was with him in the lock, and, as was usual with him, the discharge-cock was wide open. At Dr. Jaminet's request the escape of air was stopped a moment; the time spent in the lock was, however, but three and one-half minutes.

With difficulty Dr. Jaminet climbed the stairs. His pulse was 110; he was suffering severe epigastric pain, and his strength was nearly gone. He went directly ashore on the first boat. With great exertion he managed to walk from the boat to his carriage, which was about 100 yards away and climbed in. He was able to drive to his house, half a mile distant, and stagger into his office, where in a few minutes he became paralyzed. For some time he could not speak, but he retained consciousness. Gradually he gained command of himself, but his sufferings were intense, and for three or four hours he considered his life in extreme danger. It was over 12 hours before he began to move his legs. A little later he was able to walk, but he was feeble for some days.

He made several careful investigations upon the amount and character of the waste of the human system while in the air-chamber. He found that, invariably, an abnormally large amount of urine was secreted, and that it contained unusually large amounts of urea. He estimated the amount of urine secreted during the 12 hours from 7 a. m. to 7 p. m., on the average, 28 or 30 oz. per man, and the quantity of urea was far in excess of that found in the urine of a healthy laboring man, when working in normal atmosphere. The men drank water freely. They had liberty to spend their off-hours as they pleased, but the doctor requested them to lie down in the berths, provided for that purpose, for at least one hour, immediately on coming up. However, the men refused to obey the order of the physician as to the hours of rest. Each man was subjected to a rigid physical examination. All old hands deemed unsuited to the work were discharged and unpromising applicants were rejected.

A man whom the doctor had once rejected came with a friend, and entered the air-chamber without the doctor's knowledge. At the end of the second watch he was seized with severe cramps and paralysis, and it was months before he fully recovered.

There were several other cases at the East pier, and one of them was very serious. The man was badly paralyzed and broken down.

After lingering about a year he died. In the West pier a very bad case occurred under an air-pressure of 40 pounds (10 pounds less than in the East pier). The patient was sent, with several others, to the floating hospital, but the case however resulted in death. The man was really unfit to work. He had been a hard drinker for the past year, though he declared he was sober the day he went into the air-chamber. He worked but two hours.

A boy had been smuggled in by a friend, and was taken sick the first day. The next day the doctor sent him home, with the injunction not to return; but he came back two days after, and entered the caisson. After the first watch he was attacked again, and did not recover for a month. On each occasion he was insensible when carried to the hospital. He was 20 years old and very slightly built.

In a period of 50 days there were 14 cases of cramps and paralysis. Later, notwithstanding the physician's vigilance and care, cases of cramps and paralysis were of almost daily occurrence.

At the East pier men worked 3 watches of one hour each, distributed over 12 hours; pressure 49 pounds. On the first day there was 1 case, which resulted in speedy death. The victim had worked three months at the other pier, and had suffered no inconvenience. He was on duty from 8 till 9 o'clock, and felt well after coming up. As he had neglected to bring his dinner, he was allowed to go ashore at 11:30 to get a meal. He, however, got nothing to eat, but drank in a saloon. He returned just before 1 o'clock, and worked from 1 till 2. On leaving the air-chamber he, in common with the rest of his gang, came through the air-lock in less than four minutes. He was taken sick in the air-lock and was unable to climb the stairs. He became unconscious while being brought up, and died two hours afterward.

It appears that the temperature in the air-chamber was unusually high. The external air was 66°, and as no adequate cooling apparatus was in use, the air from the pumps must have entered the caisson very much heated. On the following day the air-supply came through a coil of 150 feet of copper pipe immersed in the river. The temperature in the air-chamber then fell to between 60° and 70°.

The doctor at once transferred the ice box to the air-lock, and enforced his rules strictly. In spite of the efforts to keep down the temperature, the men complained of the heat, and of being very tired on coming out, and not infrequently, of having headache. As soon as a man complained of pain or numbness, he was required to rest over one watch.

To prevent men reckless of danger from passing through the air-lock too rapidly, the size of the inlet and discharge pipes was changed, so that though the valve was wide open, the stipulated time could not be curtailed. One can imagine the imprecations bestowed on the slow coach by the men in haste to get out.

Total number of men engaged in the air-chamber were about	600
Cases reported by Dr. Clark	35
Cases reported by Dr. Ere	3
Cases reported by Dr. Jaminet	77
Cases not reported	4
Total	119
Total number of deaths	14
Total number of post mortems	8
Total number of known crippled	2

At least three-fourths of the cases that died, worked in the air-chamber only one day, and mostly but a single watch of two hours. Of all those that died from the effects of compressed air, 8 post-mortems showed the brain and the spinal cord were congested in all, and in most of them the interior organs of the bodies were also congested. There was no doubt as to the immediate cause of death.

The following 4 autopsies will show that those men were not fit for the work. Had their defects been known, they would have been rejected by the medical examiners.

Case 1. T. L. B., German, age 21 years. "The whole contents of the cranium were found highly congested, with effusion beneath the arachnoid, the vessels of the latter membrane being highly injected. Blood oozed freely

from the substance of the brain on section. The spinal cord presented pathological conditions precisely like those of the brain, with the addition of the existence of clots of extravasated blood at different points inside the dura mater; there was also a congested condition of the thoracic content, less marked, probably, in the lungs than in the other organs. The abdominal viscera were very highly congested, with extravasation of blood in the kidneys. The mucous membrane of the bladder was healthy, and the bladder contained a small quantity of bloody urine."

Case 2. J. S., age 22 years. "The brain and spinal cord were found highly congested, the latter being softened in many places to a pulpy consistency. There was evident subarachnoid effusion, and probably more than a normal quantity of fluid in the dura mater of the cord. Small clots of extravasated blood were found at different points on the external surface of this membrane. All the abdominal viscera were surcharged with blood, the lungs suffering less in this respect than any of the other organs. There were clots of blood found in both kidneys; one of the ureters was very much enlarged."

Case 3. H. K., German, age 27 years. "The whole contents of the cranium were found highly congested, with effusion beneath the arachnoid, the vessels of the latter membrane being highly injected. Blood oozed freely from the substance of the brain on section. The spinal cord presented pathological conditions precisely like those of the brain, with the addition of the existence of clots of extravasated blood at different points inside the dura mater; there was also a congested condition of the thoracic content, less marked probably in the lungs than in the other organs. The abdominal viscera were very highly congested; with extravasation of blood in the kidneys. The mucous membrane of the bladder was healthy, and a small quantity of bloody urine was found in the bladder."

Case 4. "W. S., a German, age 30 years; well-built, of medium stature. All blood-vessels of the cranium, as also the membranes covering the brain, were highly congested, and about 2 oz. of serum escaped from the vertebral canal when the brain was removed. The brain was congested and 2 oz. of serum found in the ventricles. The heart was of normal size; the right ventricle, as also the left, were normal. The lungs were inflated and of normal appearance, but there were large adherences around the base of the right, which seemed to be of long standing. The liver was normal, as well as the spleen. The kidneys were normal, as was also the bladder, but empty. The stomach normal and entirely empty; no traces of food were found, which confirmed my opinion that the man had not taken any dinner, and probably a very light breakfast, but had been drinking beer and whisky quite freely, as it was afterward ascertained."

The following case recently came under my care: T. G., 45 years old; employed by Great Lakes Dredging & Towing Company, in a caisson under construction for the Chicago & North-Western railway bridge at Kinzie street, Chicago. He left the caisson too rapidly. When he arrived at the dispensary there was some bleeding from both nostrils; skin of face and hands mottled; complained of weakness; fainting spells; no temperature but the pulse was weak. He had been employed for six years in caisson work and had not lost any time. His recovery was complete in a few days.[7]

DISCUSSION.

Dr. H. C. Fairbrother, East St. Louis: This paper is very interesting to me, because I was at the East caisson at the time of the building of the St. Louis bridge. It is an interesting subject to a railway surgeon, because that is now the manner of building every bridge—sinking the piers to a rock foundation by means of caissons, and any of us are liable to be called to cases of caisson disease. It is a rare affection, as the work is rare. The first cases I ever had in practice were either caisson disease or malingering caisson disease.

As in cases of affections of various kinds which occur in the progress of the work of a corporation, the men in that work were taken care of by the corporation, and the corporation was supposed to be liable for their condi-

7. Bibliography, by Carl H. von Klein.

tion, and, as in railroad injuries, when caisson diseases occurred the men made the most of them; and, as stated, my earliest practice was among either actual diseases brought on by the work—paralyses and a train of symptoms as numerous as those complained of by the most pronounced neurasthenic—or simulations of the disease.

The symptoms of caisson disease are simply innumerable, their number is legion, but there is one real symptom that I did not hear mentioned in the paper, and that is the effect upon the mind—the hysterical form of delirium. I have observed this symptom in men freshly brought out from the caisson; they were wild, crazy. The symptoms are too numerous to recount in the short time allotted. I was very glad to hear the paper, because it brought back my earliest recollections of medicine when as a student I saw postmortems made by Dr. John T. Hodgen and heard Dr. Jaminet's remarks in reference to these cases. In 1869-71, when the caissons for piers were being sunk, the symptoms, the organs affected and the treatment were all gone over in the medical societies and journals of that time. This is, therefore, an interesting subject for us as railway surgeons to consider.

Dr. Frank Allport, Chicago: I merely wish to report two cases of caisson disease that I remember as having come under my observation.

In one case, occurring some years ago, the drumhead was ruptured, probably on account of the rarefaction of air in the tympanic space. The entire mucous lining of the tympanic cavity was congested and swollen, presenting the appearance of having been operated on by a suction pump. The other case, which also occurred some years ago, was one of total blindness from hemorrhagic effusions in the choroid, retina, and vitreous humor. The vision cleared up from time to time, owing to the absorption of effused blood, but the integrity of the vessel walls had become so impaired that hemorrhage continually recurred until total blindness followed.

Dr. B. Malone, Memphis, Tenn.: I have never seen a case of caisson disease, so do not know whether I have any right to say much about it. But in a number of the *Journal of the American Medical Association*,* Dr. Seward Erdman, one of the medical staff of the East River tunnel, reports 1,419 cases of this disease, analyzing the cases and describing postmortem findings. He offers the most rational theory as to the cause of the disease, referred to by Dr. Owens, that I have ever seen, namely, that the disease is based on a well known physical law, as stated by Dalton, that the amount of air or gas which can be held in solution by a liquid is directly proportionate to the pressure.

When a person descends 80 or 90 feet the atmospheric pressure is increased to 30 to 35 pounds, just double the normal pressure, therefore he is under a pressure of 2 atmospheres. Consequently the amount of gas which is absorbed into the blood is just double the amount of the normal. He goes on further to call attention to the fact that no cases of this disease have ever been seen while the individual is under this increased atmospheric pressure, but only when he returns to the normal atmospheric pressure. Consequently the gas (principally nitrogen) which has been absorbed into the circulation, is thrown out of solution when the person returns to normal atmospheric pressure. Therefore this disease is produced by air emboli. Most of the symptoms are produced by air embolisms, the tiny bubbles running together in the small vessels. Other conditions caused by the air being thrown out of solution in the fluids of the body are congestion of the spinal cord and brain, splitting of the nerves and periosteum, causing pains in the legs, periostitis, etc.

This theory, of course, suggests the treatment that has been carried out in New York where the tunnels were being built, namely, when a case is seen, the patient is immediately subjected to recompression, that is, carried into the tunnel and put under the pressure of 2 or more atmospheres, and every case treated in this way improved. Some of the symptoms recurred after the patient was taken out, especially if the decompression was not carried on very slowly, but nearly all the cases subjected

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[November 16, 1907.]

to recompression, followed by decompression, recovered promptly. Out of this series of 1,419 cases there was a mortality of less than 1 per cent, which is certainly less than that of any other series of recorded cases.

Dr. W. F. Grinstead, Cairo, Ill.: When on looking over the program I saw the subject of Dr. Owens' paper I remarked that he was safe on criticism for the reason that he selected a subject that nobody knew anything about. All I know about caisson disease is what I have learned from the experience of other men—I have never seen a case. I suppose about nine men out of ten who are here today are in the same fix I am. But there are times when it is extremely important for us to know such things even though we rarely have occasion to use such knowledge.

I have asked myself the question, what have we learned practically upon this subject that is valuable to the medical profession? We certainly haven't learned very much about the treatment of caisson disease. We do not, so far as I have been able to learn, know of any remedy that does more than comfort these patients. The most valuable lesson that we have learned lies in the means of preventing the condition; the prophylaxis of caisson disease constitutes the practical part of the subject to the medical profession. It has been determined that people cannot enter safely more than 2 atmospheres of pressure. It has also been ascertained that certain classes of people cannot safely go under these high pressures. Therefore it is the duty of medical men who come in contact with this kind of exposure to advise employing officers of the kind of labor that should be employed. Very fleshy people do not stand high pressure well, therefore they should not be employed for this work. Dissipated people do not stand high pressure well, they should not be employed. People who have defective heart or kidneys ought not to be subjected to these high pressures. Therefore our value as medical men to the people who desire to take the risk of high atmospheric pressure, consists in giving the warning signal that prevents the difficulty. There is usually a mortality, if I am correctly informed, of about 3 per cent; there is a permanent disability in about 50 per cent of people who are afflicted with caisson disease. The 50 per cent who recover without permanent injury do not, I believe, owe it to any remedies that the physician has at his command.

Dr. A. W. Rudisill, Memphis, Tenn.: The treatment of these cases does not seem to amount to very much. I saw a few cases in the building of the Memphis bridge in the early 90's, and the only treatment we ever gave them consisted of morphin and atropin, and the application of heat. When the men came out of the air chambers they complained of severe cramps and a great deal of pain about the abdomen and the limbs; they came out bleeding at the ears, the lungs very much congested, with temporary paralysis in some cases, and some paralyzed permanently. Along toward the latter part of the work we learned the best thing was care in selecting the men, being sure that they were physically sound to start with. We found that whisky drinkers were not good men for that business. The only autopsy I ever witnessed was on a man who died soon after coming out of the caisson. He had intense congestion of the meninges and cord, also congestion of the brain, and on making section of the brain substance, blood oozed out. There is a great deal of complaint from those men even yet that the hearing was very much impaired by the pressure. But the worst trouble in the majority of cases is due to muscular cramps, or pains in the muscles, which were often terrifying, and there was usually marked delirium for a few hours or days. There did not seem to be much treatment possible. We simply gave them something to make them comfortable and applied artificial heat.

Dr. Owens (closing): I believe I have nothing further to say. Prophylaxis is the chief thing, as mentioned by Dr. Grinstead, being careful to select healthy men under 45. The decompression change must be made slowly, and for extensive work air-chambers provided in which the men can rest for a time. The climbing of the vertical ladder at the end of each shift it seems to me must be a bad thing.

THE RELATIONS BETWEEN THE SURGICAL AND CLAIMS DEPARTMENTS OF RAILROADS.*

L. L. LOSEY, ESQ., CHICAGO.
Chief Claim Agent I. C., Y. & M. V., and I. S. Railroad Companies.

Mr. President and Gentlemen of the Association:

For the honor of addressing you, I am indebted to your distinguished Chief, who has invited me to discuss "The Relations Between the Surgical and Claims Departments of Railroad Companies" and for your protection, with characteristic forethought, added the injunction that I should not occupy more than fifteen minutes of your time. Conscious of my limitations and sincerely distrusting my ability to command the interest of so learned and discriminating a body, whose professional duties embrace mental as well as physical diagnoses, I invoke your patience and shall esteem myself most fortunate if I escape mental dissection at your hands.

There are so many angles of contact between the Surgical and Claims Departments and such interdependence for consistent, intelligent action as to render it impossible within the limits of this paper to more than generalize.

Neither department can justly claim the distinction of antiquity as an organized factor in railroad economy. Today, however, they are typical representatives of organization and progress, coeval in age, coequal in responsibility. They are the joint product of conditions which within the last half century have witnessed the evolution of the railway system of the country from a mere pigmy, overshadowed by water carriage, into that strong young giant, and advance agent of, a higher civilization lacing the continent with a quarter million miles of track equal to the distance from the earth to the moon, and sufficient in extent, nine times completely to encircle the earth, penetrating every recess where commerce can find a home, employing 1,700,000 men, guided by masterful minds in handling its colossal interests and annually drawing from its treasury a billion dollars in wages alone. It thus directly and indirectly supports nearly 7 millions of persons, or one-tenth of the population of the nation, carrying annually one billion passengers and more than 1½ billion tons of freight. Concurrent with every stage in the remarkable development of this stupendous enterprise, this grand public utility, despite the adoption of every known preventive, there has been a corresponding increase in casualties. The year 1906, last reported, showing 10,688 fatal, and 97,992 non-fatal injuries with the following classification:

Passengers killed	647
Passengers injured	13,597
Employes killed	4353
Employes injured	62,689
Others killed	5,688
Others injured	21,706

Yet, remembering that but one passenger was fatally injured for each 2,227,041 carried, and but one injured for every 2,333,859 passenger miles accomplished, this apparently large number of casualties, the result of the active operation of 21 millions of cars and engines, distributed among 2,213 separate railway corporations, and charging to other causes those not due to train movements, should not excite our special wonder and I advert to it here only in proof of the magnitude of the work demanded of Surgeon and Claim Agent.

Logically and of necessity the activities of the railway surgeon are called into requisition in advance of those of the Claim Agent in that upon him is developed the important duty of pre-determining what applicants are physically fitted for the arduous manual labor required. He can thus through rejection foreguard the railway against fraudulent claims for pre-existing injuries which otherwise might be charged to an accident while in service.

The first real point of contact and co-operation occurs in cases of actual trauma. The Surgeon as humanitarian and adviser, the Claim Agent in the dual rôle of utilitarian and humanitarian—terms not infrequently interchangeable. In many cases the Surgeon learning from the Claim Agent the facts surrounding an accident is able to determine that the

*Read at first annual meeting Joint Surgical Association, I. C., Y. & M. V., and I. & S. Railroads, Memphis, Tenn., February 27, 28, 1908.

injuries complained of are not referable to it and thus aid in preventing the consummation of a preformed purpose upon the part of the patient to defraud the railway. Here begin the serious difficulties that encompass the Surgeon and Claim Agent. For the Surgeon they are many. For the Claim Agent, legion.

Upon the diagnosis and prognosis of the Surgeon largely depends the action of the Claim Agent. The former can often forecast the result of an injury with the certainty of the Surgeon whose double office required him to minister to both the physical and spiritual needs of humanity, who when asked what he would *administer* to a man who had taken oxalic acid, promptly replied—the sacrament. He is best equipped for determining and should promptly advise the Claim Agent when the condition of the patient mentally and temperamentally first warrants the intervention of the Claim Agent, thus aiding in effectually blocking the way of the unscrupulous lawyer, who failing at the outset to secure employment later seeks to set aside a just and equitable settlement by alleging mental incompetency. Here are met and to be combatted with the combined effort and energy of Surgeon and Claim Agent the forces of evil which in unholy alliance hover like birds of ill-omen about the couch of the injured, seeking to poison his mind with the virus of speculation with no regard for *his* interest, animated alone by the desire to slake their thirst for gold at the treasury of the railroad company, finding a panacea for violated conscience in the popular teaching of demagogues and barrelhead political orators that all aggregated capital is concentrated for the sole purpose of wrong and is therefore legitimate prey. Is it to be wondered that the simple-minded honest, but observant man, all unused to the finer distinctions of definition, stoutly asserted that capital punishment should be abolished, declaring as a reason that capital had already been punished too much?

The phenomenal increase in the volume of commerce has quadrupled the number of injuries wrought through its agency within the past decade and opened a fertile field for fraud through practices erstwhile unknown. Time was when the lawyer jealous of the honor of his profession, with just pride in its traditions and achievements, imbued with the spirit of its teachings which made him the arbiter and not the active wanton agent of attack, rejoicing in the history of that noble army of brilliant, patriotic, pure and profound men, who have left a lasting impress upon every age, illustrated the brightest pages of legal literature and written their names upon the very dome of the temple of statesmanship, followed implicitly the path they had lighted and refused to compromise conscience or ethical conviction.

Unhappily this age has developed many degenerates, who trailing the mantle of this proud profession in the dust, unblushingly adopt methods which once would have consigned them to professional oblivion. In the sacred name of justice, these self-seeking vampires perpetrate irreparable wrongs, beguiling with seductive speech the unwary injured who listen to their specious and false promises of large recoveries, only later to learn they have been lured to their undoing. A single instance among the many which have come to my knowledge will suffice as an illustration.

The attorney who had induced an injured employe to retain his services effected without suit a settlement of the claim with the railroad company for a sum no greater than it would have paid the claimant direct, and on closing the matter with his client retained 75 per cent of the recovery. Undeceived at last, the dissatisfied client turning to the attorney said, "Mr. Lawyer, until this mornin' I thought it was *my* leg that was hurted."

These legal scavengers even at times with characteristic effrontery invoke the action of the *railway* in aid of their unjust exactions. In this they are about as consistent as the boy who called to his mother to make his brother Bill *behave* because Bill yelled every time he hit him on the head.

Full brother in iniquity to the predatory lawyer is the surgical empiric who in the guise of a good samaritan quick to detect human weakness with honeyed words and roseate pictures of wealth and opulence seduces the conscience of the patient, fundamentally honest, and by insidious methods induces him to exaggerate and more often simulate injuries. This

accomplished, the lawyer readily succeeds by subtlety in persuading the patient to distort the facts and thus an unholy triple alliance is formed in which all are equal partners, sharing alike in the infamy of a judicial robbery.

It is your province to expose and destroy the web of exaggeration and fiction deftly woven by the surgeon who degrades his profession to gratify his lust of gold and Judas-like betrays his honor, and to drive him from the temple which he profanes.

Through his ministrations the surgeon is brought in touch with the *flotsam* and *jetsam* of humanity, the prince and the proletarian, the indigent and affluent, and through sympathy and skill becomes more strongly intrenched in the confidence of each than any other, with the doubtful exception of the spiritual adviser, thus unconsciously acquiring a potential influence which well directed safeguards alike the interest of the patient and the railway.

I am not unmindful of the proprieties that hedge about a guest, and if for a moment I wander into the field of suggestion, do not charge it to the Claim Agent, but rather pardon it to the freedom of professional intercourse, as being an honorary member of the American Academy of Railway Surgeons, *I* am a sort of *brevet* surgeon. If this apology will not suffice, I beg you to refer it to my profound interest.

With a candor born of confidence, the patient will at the outset declare to the surgeon the actual truth as to the cause of his injury, but later impelled by selfish interest misstates the facts to the Claim Agent and finds a willing ally to corroborate him. The value of this first statement properly attested can not be overestimated. If he simulates, the surgeon through having him under constant observation can detect and expose it and for this purpose should by seeming accord restrain him from seeking other surgeons who would further his dishonest aims.

The surgeon's duty does not confine him within a groove. The interest of the railway which he serves should not be subordinated to the selfish interest of his patient. He should stand ready to rebuke a spirit of avarice, fraud and extortion, whenever and wherever it raises its hydra head. As *he* trusts in the honor of the railway which employs him, why should he not bespeak for it the confidence of his *patient,* leading his mind into a receptive condition, directing it away from imaginary ills, exhorting him to honesty, warning him against the wiles of unscrupulous attorneys and their allies, and impressing upon his mind the truth so little understood that corporations have *human attributes.*

It is not desired that he act in the dual capacity of surgeon and claim agent, yet he should not hesitate on his own initiative to use his influence in an unobtrusive way and within proper limits to bring the patient and the claim agent together upon a plane of equity. This he may do without lessening his dignity, compounding with conscience, violating any canon of propriety, or in the language of the street "spraining" his influence. He can be specially helpful in preparing and exploiting the surgical side of a suit, testifying, selecting experts, preventing extortion in fee bills, promoting sanitation, conferring with State Boards of Health and in innumerable ways promoting the ends of justice.

We should not gauge our work by the wage. Such work is never *worth* the wage. We are worth what we *give* to the world, not what we *get* from it. We should exalt our work and not rely upon it to exalt us.

At times we hear of the restraint imposed by professional *ethics,* a royal word in its larger significance and it is to be noted that the man who gives to it a *narrow* interpretation becomes selfish and atrophied and in the grand mission of life falls far behind his brother whose broader horizon finds in it a larger meaning.

Embarrassments sometimes result from surgeon's reports in which material words are undecipherable, not unlike the case in which the husband, called away from home during his wife's illness in his anxiety telegraphed her surgeon only to receive the reply, "Your wife had one child today, but if we can keep her from having another tonight, she will be all right," the operator having mistaken the word *chill* for child.

May I modestly suggest that the use of technical terms which might be reduced to simple

English is confusing. Instead of "Aphasia" why not employ the language of the bridgeman who falling from a scaffold was anxiously called to by his fellow who asked, "Mike, are you dead?" answered, "No, I am not dead, but speechless." The suggestion that his condition made treatment by balneotherapy necessary would shock and frighten the patient to whom "a bath was neither a reminiscence nor an aspiration," and confuse the son of Erin, who desiring to purchase a bathtub for his first born on inquiring the cost, being told $3.00, promptly said, "I've not got the price and we'll just kape on bathin the kid in the coal scuttle." It should be kept in mind that these reports interlarded with technical terms, while primarily for the use of the chief surgeon, pass on to the claim agent and attorney and always without glossary. I may here add that the value of reports is much greater when they are promptly furnished.

No where is the necessity greater for leveling your language to universal comprehension than in the courtroom, for it is a legal *fiction* that in all cases jurors who try the issues are your peers at least intellectually, and while laymen of liberal education understand that:

Femur and thigh bone,
Maxilla and jaw bone,
Patella and knee cap,
Ankylosis and stiff joint,

are convertible terms, the average juror does not, and further resents what is not intended, but what *he* interprets as a disposition to ignore him by talking over his head. It follows that the "root and herb" and other self-styled surgeons who have no greater skill and little more learning than an Indian medicine man, masquerade under the title of surgeon, endeavoring to compensate for lack of learning by impressive hirsute appendanges that would have put to blush a high priest of the Mosaic hierarchy, not infrequently command greater attention and exercise larger influence over the minds of jurors than learned and scientific men. Justice is thus defeated and the interest of the railway made the plaything of ignorance. The corrective is easily applied.

Even the surgeon's best efforts to *please* are not always appreciated. In one case after prescribing a diet of eggs and wine, asking the patient how he liked it, expecting to be profusely thanked, he received the reply, "if the wine were as old as the eggs and the eggs as new as the wine, it would not be so bad."

Happily for him the surgeon escapes the pathetic and nerve-racking ordeal to which the claim agent is subjected when fronted by the woman—widowed without the assistance of the surgeon—who in the bitterness of a bereavement overshadowing her judgment inveighs against the railway and resents with all the force of her nature even the mild suggestion that the railroad is blameless. Time, however, mercifully tempers the most poignant grief, as with the good but resourceful woman whose sorrow found expression in the erection of a monument to her dead, later as a salve to the sensitive soul of another *prospective* husband, to the original epitaph, "The light of my life has gone out," significantly added, "But I have struck another match."

Your achievements are your lasting monuments. No panegyric can add to the glory of a profession whose beneficent influence like a line of light has shone through the centuries, broadening and brightening in its course, scattering blessings with lavish hand and lightening human sorrow in every country, every clime. Preserving the best traditions of your exalted profession you are today standing upon the vantage ground of all the past and untouched by the creeping paralysis of self absorption with tireless brain and unresting energy forcing from reluctant nature the secrets long locked in her bosom, and reaching out to discover new agencies with which to conquer in the unending battle with human ills. If past achievement and present effort are prophecies of the future, what marvels in surgery may we not yet witness at your hands.

If for that consecrated body of men known as Claim Agents I claim the same high qualities, the same lofty ideals, the same unselfish devotion to duty which animate you, I trust you will not feel that it is immodest or undeserved.

There should be perfect co-operation and co-ordination of all of the departments of railway service, all touching and neither overlapping or trenching upon the province of the other.

. In a spirit of mutual helpfulness linked by a common purpose in the kinship of mutual effort, conserving the interests of the great corporations which we represent, let us go forward building better as we advance that we may transmit to those who come after perfect organizations, admirably equipped and successfully administered—and if at times by word or act the one should unconsciously touch the sensitive nerve of the other, let the shifting sands of time efface its memory and leave no scar.

DISCUSSION.

Dr. H. C. Mitchell, Carbondale, Ill.: In regard to the point made by the reader of the paper relative to the "first statement of the injured," I do not believe that we as railway surgeons can emphasize its importance any too strongly. We know that at the time the first statement of the patient is taken he has not as yet the "gold cure" in mind; he is not thinking of litigation wih the company. At that time he thinks more of getting well. You can get then an honest, truthful statement. Should you take a statement from the same patient ten days later, you would, I believe, get the facts controverted very greatly. Therefore, I believe that we as railway surgeons can not be too careful in taking the first statement. It has been my custom for a number of years to get this statement as accurately as possible and have the patient sign it himself.

Dr. J. L. Crook, Jackson, Tenn.: I move that a resolution of thanks be extended to Mr. Losey for his very fine paper, so beautifully worded and carefully prepared. (Motion seconded and carried.)

Q. I would like to ask the Chief Surgeon a question in regard to the use of technical terms in making reports. Where we have a chief surgeon, I thought it was proper to use technical terms, and I would like to have his opinion upon the subject.

Dr. J. E. Owens: These reports do not remain with the Chief Surgeon. They go to the claim agent, to the attorneys, to the assistant claim agent, to attorneys here and there along the line, and the Chief Surgeon would not have time to change the technical into plainer language. Therefore it seems essential that they should be made out in as plain terms as possible.

SOME SURGICAL DON'TS.*

L. C. HENLEY, M. D., CHICAGO.
Surgeon Illinois Central Railroad.

Before reading my paper I want to say that most of my thunder has exploded already. Some of my remarks may sound a little like heresy to this body, but they are prompted by personal experience. Even at that, however, I would not venture to make them if I did not recall that last year, I believe, Dr. Fairchild called attention to some of the same points. After I have finished my paper, I want to exhibit a case which will have a little bearing on the discussion we had yesterday in regard to the use of general or local anesthesia in cases of injury to the hand.

More frequently met with, and probably less frequently discussed than any class of injuries with which we have to deal, are injuries to the fingers. *Don't* think, because no one has considered the subject worthy of discussion, that the injuries themselves are not worthy of consideration. We meet these injuries every day, injuries ranging from a slight contusion to complete crushing of a number of fingers. In your treatment of them *don't* forget that it is with his fingers that your patient must earn his daily bread, and, on the principle that a penny saved is a penny earned, just so near as you restore his injured fingers to their normal state, just that much have you increased his earning capacity.

In the treatment of injured fingers I have come to believe that the first of all rules should be *"Don't* amputate." Of course there will be occasions when you must amputate, but I believe these occasions are so few that they can be classed as exceptions to the rule. One can hardly realize how badly a finger may be mutilated, and yet recover to become a valuable

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

member. I have seen many fingers with comminuted fractures and tissues so cut and lacerated that they seemed almost ready to drop off, recover with but little impairment of function. *Don't* amputate a finger if you can detect the slightest sign of circulation beyond the point of injury.

Don't be too vigorous in your efforts to clean a badly lacerated finger. My personal experience leads me to believe there is comparatively little danger in the ordinary shop or train grease, and you may do great damage by increasing lacerations and cutting off still more of an already meager blood supply. Of course, foreign bodies should be removed from the wound, but this should be done gently with small tissue-forceps or a probe wound with cotton.

Don't use too strong or too irritating antiseptic solutions or you may kill your finger with poison. Use only weak solutions or sterile water.

Don't be too handy with your needle. Use only enough sutures to keep the parts in fair apposition. In many cases I have considered it inadvisable to use any, but merely placed the tissues in as good position as possible and trusted to the dressings to retain them in place. It is very easy to choke off a much-needed blood vessel with a suture.

If a phalanx is splintered, *don't* attempt to remove those pieces that adhere firmly to the soft parts, especially if you must increase your laceration to do so. They will probably unite with the larger fragments, or form a ground for the formation of new bone. If they do slough it will probably do no harm to let them remain until the tissues have recovered somewhat.

If you get a finger with one-half the distal phalanx off, *don't* amputate the other half in order to get a flap. Tear off the scar tissue as it forms or curette the edges of the wound, thus enabling the skin and underlying tissues to continue their growth, and you will often get a finger requiring close observation to detect signs of the injury.

If you have a patient with a gaping cut on any part of the body, involving only the skin and superficial tissues, *don't* leave it open because the patient tells you not to suture it. When it heals with an unsightly scar he will throw all the blame upon you. Zinc oxid adhesive strips will hold the edges of the wound together, but you must use very narrow strips and watch them closely for they have a tendency to macerate the edges and prevent union. I consider plain sterile gauze and collodion much better. A strip of gauze 3 or 4 inches long and a little wider than the length of the cut, placed so as to bridge the cut when the edges are brought together, and fastened at each end with collodion, will generally give entire satisfaction. When you do suture a wound *don't* use the largest thread you can find, especially for cuts about the face. You can keep the edges together without using a section of a 2-inch cable.

In fractures of the extremities, especially fractures near the joints, *don't* leave the parts too long without inspection and passive motion. In Colles' fracture especially, I can conceive of no good reason why the injured arm should be left undisturbed for a long time. I have observed these rules in the treatment of a number of these fractures and in no case has marked deformity or impairment of function resulted. In one or two cases displacement had recurred. My inspections enabled me to detect this in time and to readjust the parts.

Don't be too positive in your diagnosis or prognosis. Encourage your patient all you can but *don't* do it by making statements that are too positive. You cannot always guess right. I have attended over 8,000 cases for the Illinois Central, and the more cases I handle the less positive I am in my statements to the patient.

For example, you often have patients who have received a blow upon the hand, and it is impossible to tell whether he has simply a contusion or also has an incomplete fracture of a metacarpal. If you tell your patient he has a simple contusion and a bony callus develops afterward you are considered a fool, while if you tell him positively he has an incomplete fracture and all his trouble disappears in a few days, you are a "grafter" trying to nurse a case.

The same remarks hold good in regard to your prognosis. I recall the case of a carpenter whom I attended eleven years ago for a com-

minuted fracture of the left patella. The patient persisted in shifting his bandages so he could see his knee, I found him out of bed about one week after he was injured, and about one month after the accident the patient informed me that he was all right and was going back to work soon. I believe no one would criticise me for telling the man he would be a cripple if he did resume work. He did go back to work shortly after, has had no trouble with the injured limb, and every time he meets me he laughs at the efforts I made to scare him. In that case I was the grafter. In contrast to it was a recent case of an apprentice who received a moderate contusion of the distal phalanx of a finger. I informed him he would be all right within a few days but, although there was no infection, the bone necrosed so that it became necessary to remove part of it. In this case I was the ignorant fool.

I have one more "don't" to present, one that I believe it is absolutely necessary for you to observe if you desire to attain the highest degree of success in the practice of either medicine or surgery. DON'T BE A KNOCKER. During my experience at Burnside I have had so many "knocking" remarks made by different physicians quoted to me, that I sometimes wonder if such a thing as a "Code of Ethics," ever existed. Knocking will do you no good. You may lower the other physician in the estimate of his patient, but *don't* forget that the average man has little use for any physician who speaks ill of another. You do not know the conditions under which the other doctor worked. The trouble may have been more severe than you believed, the patient may not have followed instructions, or several of a thousand and one things may have complicated the case.

Remember also that the other physician's opinion of you may be on a par with your opinion of him, so *don't* wait until one of your cases falls into his hands before you remember the code. You may have cause to regret it if you do.

I wish to exhibit this patient, upon whom I operated 9 days ago. He received the injury in what they call the joiner in a planing mill, the knives catching his hand in the back and lacerating all four fingers. It was necessary to take them off at the proximal joint, or just above. This patient had no general anesthetic, had no local anesthetic, did not have even a drink of whisky. The opinion was expressed here yesterday that a finger could not be amputated without some kind of an anesthetic. There is a little sloughing where one of the parts was so badly lacerated, a little discharge, but I want to ask whether it is such an awfully bungling job. Union at the two corners of the hand is complete, only in the center where there was such great contusion is there any delay in the union.

DISCUSSION.

Dr. J. L. Crook, Jackson, Tenn.: In regard to jollying, there is a great deal in the impression you make on the patient's mind, Christian Science, for instance. I recall one or two cases in which I applied cocain, which I use occasionally, and these cases made a great fuss about having the fingers amputated; I told them I would apply something to take away the pain, putting on a little water, and it was all right—it hurt a little, but not much.

Dr. E. S. McDonald, Cameron, Mo.: I am very glad to have heard that paper on "Dont's." The old Hippocratic idea that ethics must be ideal or utopian, is always in some other field—it does not apply to our practice or to our confréres or competitors rather. I am glad the Doctor exhibited this case. I stated yesterday that I do all my operations below the wrist, without general anesthesia, and all the operations I have done for 24 or 25 years have been without the use of chloroform. Those operations without a general anesthetic have been done with little complaint, and I have never had occasion to regret not having used a general anesthetic. I have had more trouble in some cases by administering chloroform for an operation than I have had in other cases, equally as important, without it. Patients sometimes get to be very obstreperous and hard to manage, it takes two or three men to hold them down. In those cases some resort to strapping to the table, a thing I would discourage entirely.

A patient came to me with a lacerated finger (I mention this to sustain the Doctor in his admonition not to amputate if it can possibly be avoided); this case was that of a section

boss, an old man, who came to me in a state of shock. A cross-tie had fallen on his hand, and you can imagine the injury it produced on the metacarpal bones and index finger. There was a compound longitudinal fracture of the shaft of the index finger, which was so lacerated that I could scarcely see where I could take stitches. My first impression was that I had better amputate that finger. I so stated to the patient, but he objected to it. So I gave him the benefit of the doubt, cleansed the finger, dressed the hand and took 2 or 3 stitches just to hold the flap together as nearly as possible, hoping I might get a result that was satisfactory. The patient made a nice recovery of that finger, and it looked so nearly normal that I was surprised myself and felt self-condemned for offering to amputate in that case. I believe in conservative surgery. I believe we have done great injustice in many cases in amputating the organs of prehension, for we need them. The deformity is bad in the first place, and the usefulness of the hand makes it criminal to amputate a finger or any part of the hand if possible to avoid it.

Dr. W. H. Baldwin, Memphis, Tenn.: There is one feature mentioned by the essayist that I feel quite an interest in, and I am sure that all do who have occasion to deal with this class of practice, and that is the disposition of foremen to receive men who are able to perform only partial service during the period of recovery, which sometimes makes recovery very unfavorable. It is not an easy matter to settle. They are accepted, but by the railroad people less frequently than by manufacturing institutions. One point in conservatism, particularly in cases of injury to the fingers, which we do not have to consider quite so much where the low temperature is not so extreme as here, and that is the circulation of the parts. In the South where the cold is not so extreme we do not see the bad results following extensive cicatrices of the finger.

Dr. E. H. King, Muscatine, Iowa: The paper is an admirable one, for the essayist has something to say, he has said it and quit—a very fine rule to be observed. It had in it two points I wish to mention:

Do not pass an opinion upon other men's work. If a man comes to you with an injury, a fracture or anything of the kind, that has been attended by some one else, and says, "Doctor, what do you think of this?"—he wants your opinion, and nine times out of ten he is working up a malpractice suit and wants to get a physician's opinion. If you say it is a bad job or very good or something of that kind, that is what he is after.

The second point is that in injuries to the hand or extremities, secure first as useful a member as you can, and, second, a good cosmetic effect if possible. Now, we might attempt to save a little more and get a more beautiful result in an exposed part in the case of a lady, than in a working man.

I remember very well happening into the Chicago Emergency Hospital a number of years ago when Christian Fenger was in attendance there; a workingman had been brought in with a bad laceration on the ulnar aspect of the hand, the tendons and metacarpal bones entirely destroyed. The attendants had cleansed the wound and Fenger came and was looking the hand over, examining the fingers, spending some time in considering the case. I said, Doctor, can you save those fingers?" "Yes, I can save them, but what is the use? The tendons are hopelessly destroyed, the metacarpal bones crushed, if they are saved they will be useless, the nerve connections are in such condition that the hand will be numb and cold, and he is a working man. I might save those fingers and have them flexed in the palm, and he would be laid up three or four months; but I can get plenty of skin for a flap, we will take those two off and we will have a useful hand with two fingers and in a month he can get back to work." I watched him as he removed those two fingers; he had enough skin to make a good flap, and he left the man with a useful hand with thumb and two fingers. The two fingers flexed would have been stiff and in the way. One might say, "He should have saved them." Possibly so.

I had a brother who injured his hand, and he carried those two fingers flexed in his palm the rest of his life. He could not wear a glove, but had to have a mitten or have gloves specially made, and he complained of the fingers

getting cold, in the winter they always bothered him, and he frequently said, "I wish they had been taken off."

So the point is, as has been said, Can we get a useful member? I had a case which illustrates this: A farmer struck the finger with a sledge hammer and crushed it badly. I saved that finger, but it is stiff and stands straight out, always in the way, and the man said to me one day, "Doctor, I have a notion to sue you for malpractice for leaving that finger, it is always in the way."

Dr. E. J. Waddey, Waterloo, Iowa: This question, like a good many others in this line of work, opens up such a big field, it would take a long time to cover it all; but I would like to touch on one or two points in this connection. Dr. McDonald just told us about a finger that he thought was hopelessly injured, but which afterward made a good, useful finger. Dr. Christian Fenger's opinion was as good as almost any individual opinion, but no one knows how good a finger he will get or whether or not the nerve in that finger has been destroyed. For my own part I would prefer having my finger left on, with the opportunity of having it taken off later if the nerve was destroyed and the finger cold and stiff and in the way—I think I would be brave enough to have it taken off afterward.

The essayist is to be complimented on his modesty in taking a subject of this kind, because the more scientific subjects are usually quite alluring to the men who read papers, but nevertheless are of less daily practical importance to us. I believe most of our time ought to be spent in this kind of study, which is of interest to so many men who have to earn their bread with their hands.

Dr. J. L. Crook, Jackson, Tenn.: I was especially struck with the amount of good meat in this apparently simple paper, that is, simple from the standpoint of its title. Every sentence was, we might say, practically a surgical aphorism, and certainly a great many of those rapidly fired shots projected into this assembly will be of vast benefit to us if we take them home.

The next point I desire to refer to is in connection with the use of the word "jollying"; I wish to ask the pardon of the Association for using that word, because it does not express the idea I meant to convey. I think in surgical as well as medical treatment we should take advantage of every idea from whatever source that can be used for the benefit of our patients. I believe that the Christian Scientists have taught the medical profession a great deal, they at least have laid down many things which if we are close observers we can derive benefit from. There is a great deal to hypnotism if used properly, but I think it should be designated by the proper name when physicians employ it —therapeutic suggestion.

In local anesthesia especially, therapeutic suggestion plays an important rôle. If you have your patient's confidence and your own self-confidence, and tell the patient that the fluid you are injecting will render the operation absolutely painless, you have won half the battle if he believes it. There is no doubt whatever that if the mental attitude of your patient be one of confidence in the physician, this will have a great deal to do with the result of the operation and as to whether or not it is painless, and I believe the Doctor's influence over the patient has much to do with rendering the operation painless. Some have confidence to use therapeutic suggestion alone, but I use the local anesthetic and then try in every way possible to secure the patient's confidence and do an operation absolutely painless to him.

Dr. H. B. Hemenway, Evanston, Ill.: I am very glad Dr. Crook has made this admission. Yesterday he made argument in favor of local anesthesia; today he admits that a good share of his results is due to therapeutic suggestion. That is exactly in line with my own experience. There are certain cases in which owing to the nervousness of the patient, to get them completely under control it is necessary that the mind be anesthetized more than the nerve be anesthetized. It is the fear rather than the absolute pain which affects them.

A remark made by Dr. King, I think, relative to injuries of the fingers, brought to my mind a case which I had a year or so ago. A carpenter had a nail driven in the back of the middle phalanx of the index finger. He sought no professional advice for some considerable time, and when he did come he had a general

infection. Although the bone of the phalanx was completely necrosed and the tendons sloughed, I left the finger on, and, surprising to say, he has a good and useful finger today. He was showing it to me just a few days ago, and said, "That finger is worth a great deal to me." As the wound healed there was a tendency for the finger to strongly flex, due simply to contraction of the cicatrix; and so I warned him about it, telling him that every day he must use oil to soften the parts, and stretch the finger out as straight as he could. There is no danger in these cases of getting it too straight; that is to say, the tendency to contraction is so great that the finger would be left somewhat flexed anyway. His finger is now flexed at an angle of perhaps 10 degrees. He has no motion practically of the distal phalanx, and yet with the slight curvature that it has, and in spite of the fact that the distal phalanx comes right down to the proximal one, shortening the finger, he has a very useful finger today.

Dr. S. H. Burnside, Wichita Falls, Texas: In these cases I believe the results we should strive to attain depend very largely as to which finger we are operating on. I would hesitate about taking off the index finger, even though it stood out straight, but I do not believe it is good surgery to preserve a second or third finger and leave it stiff. It would be better to take it off so that the hand can be shut. If you leave those two fingers stiff, there is trouble about shutting the hand to grasp anything. In one case I left the finger standing out that way and the man never forgave me for it. He cannot get his hand together to catch anything, and he is not brave enough, as one gentleman suggests, to have it removed.

As regards the question of "knocking," is there any class of men who do that less than physicians and surgeons?

Dr. D. W. Beattie, Neligh, Neb.: There is one "Don't" that was overlooked, which, if borne in mind, will help us out in cases of stiff fingers many times, and sometimes in several stiff fingers: *Don't* forget to look for severed tendons. If you have a wound in the palm of the hand and it has cut off the flexor tendons, the tonicity of the muscles will draw upon the extensor tendons and you will have a hand or finger that will constantly bend back farther all the while. If you will watch for those flexor tendons, or the extensor tendons if the reverse be true, you will be able to prevent this constant flexion or extension as the case may be more and more all the while, and the time to attend to that if possible is as soon after the injury as possible. The amount of retraction in these tendons is surprising, and it is no easy matter to go after a tendon when you have to cut down after the wound is all healed.

To come back to anesthesia again; I have thought over this subject since yesterday, and I would say this: My plan in those cases is to make every case a rule unto itself. With the average man it is best to be absolutely honest, saying to him something like this: "I have to do a little work on this; wouldn't you prefer to suffer a little pain now than to take the chances of being sick for some time from the after-effects of a general anesthetic? And if I use cocain I am likely to devitalize the tissue so that the parts will not heal so well; so cannot you stand it?" And he will say, "I will try it, Doctor." I have done a great deal of work on the hand just on the fortitude of the patient.

In regard to amputation, I will say to you as I said yesterday: Don't be in a hurry to amputate; you cannot always determine whether a finger will be useful or not, and if you take proper care of it you can do a secondary operation if necessary even a year afterward. I take my chances on saving a great deal of the hand, because no matter how extensive the injury or how much work you do, many times you will be surprised to see how well you come out in the usefulness of the hand.

Dr. G. F. Beasley, Lafayette, Ind.: The Doctor in speaking of wounds about the face told us not to leave the sutures in too long. Did you ever try taking the needle and running it through, approximating the parts exactly, then making a figure-of-eight with silk suture, pulling it snug, then coating the whole thing with collodion and as soon as it sets, pull out the needle? There you have it firm and no not have sutures to take out afterward, and you get a good result.

In regard to the discussion yesterday, I want to take back what I said about the whole thing.

This makes me think of a story I heard down South. A young man started in at College, and his preceptor told him he must always notice what people do and say even though he did not understand it. The first case was one of pleurisy, the man suffering intensely and not seeming to get along; the doctor came around, and upon the patient saying, "We killed a shoat," the doctor said, "Let the patient have all the roast shoat he can eat." So the young man wrote down, "For pleurisy give roast shoat." The next day he called to see another case of pleurisy and said, "What you want to do is to kill a shoat and make this fellow eat all he can of it." He went back the next day and the patient was dead, so he wrote over his former note—"sometimes." So in these cases, sometimes we get good results.

Dr. K. W. Doege, Marshfield, Wis.: In case of crushing of fingers in babes and small children, we are at times confronted with inability to cover the stump. I will add one *"Don't"* in such cases. Don't try to cut it. In many cases I have simply dressed it and in a few days the entire stump will be skinned over.

Dr. Henley (closing): One of the points upon which I thought there would be considerable discussion, and which has not been mentioned, is—*"Don't* be too vigorous in your efforts to clean." We had some remarks made yesterday about thorough scrubbing, and that we must employ the same degree of force to get dirt out as was used to get it in. I can only repeat my remark. There is, I believe, comparatively little danger in ordinary shop dirt. Of course, in the case of the dirt we get from old cars, and especially stable cars and around passenger coaches, we have to use a little more vigor than in the case of the machine shop and engines.

I wish to refer to remark made by one gentleman in regard to foremen taking men back in the shops before they have entirely recovered. My views are directly opposite on this question. I encourage the man to go to work for two reasons: A man who has to lay off from work is in a very bad frame of mind; he wants to get back and earn money, unless he contemplates suit right from the start. I have not noticed very much difference in the rapidity of recovery between the men who went back to work before complete recovery and the men who laid off during the entire period. I have noticed that those who are able to go back and take some light job are better satisfied, there is no resentment against the company or the doctor, and he tells his friends, "Why, I was injured, but I was back to work in 10 days; the doctor did a pretty good job, it is a good company to work for." So I believe in putting the man back as soon as he can go to work, and I always solicit the foreman to give him something to do.

In regard to saving as much as possible, I want to say that you can cut a finger off any time, but after you once cut it off you cannot put it on again. But a finger that is stiff and straight is in the way and is worse than useless. If it is going to heal stiff, keep it flexed in about that position (indicating), and you cannot realize the value that such a finger is to a man who works. A finger bent in that position can be flexed close enough to the palm to grasp any implement a man has to use.

One of the gentlemen made a remark about bones and tendons being sloughed out and yet the result being a good finger. I have observed cases in which much of the phalangeal bone has sloughed, but with careful treatment pus formation has been checked and new bony tissue has formed. Of course, this result will not follow if the sloughing has been too extensive.

From a large number of cases it would seem that the *percentages of the three varieties of hernia*—inguinal, femoral and umbilical—taking both sexes and all ages together are as follows: Inguinal, 73.41; femoral, 18.0; umbilical, 8.47. The fraction left (0.12 per cent) suffices for all other varieties.—*Eccles.*

A reducible hernia may cause but little inconvenience to the subject of it, but it must always be remembered that at any time it may become strangulated, which is an intensely dangerous condition. On the other hand, a reducible hernia may be an intolerable nuisance.—*Eccles.*

ADDRESS.*

ROBERT J. CARY, ESQ., CHICAGO,
General Counsel Chicago, Indiana & Southern.

Mr. President, Gentlemen of the American Association of Railway Surgeons: I once heard President Eliot of Harvard say that theology and medicine were the two missionary professions. If that be so, it requires a great deal of temerity for a mere lawyer who deals only with material things, to appear before you and attempt to say anything to you upon your specialty, but the title of your Association may, I think, give me that opportunity.

The railway lawyers are engaged largely in dealing with dollars and cents. You as physicians, I appreciate, have such thoughts as far as possible from your minds, but as railway physicians perhaps you are compelled at times to deal somewhat with the questions of materialism. The law department of a railway is, I believe, more or less like a fire department; we pretend (I do not say we do)—we pretend to know a little something about the business of almost every other department of the company, and when any other department gets in trouble they generally come to us and ask if we will do what we can to help them out. We do come in contact with you, the surgeons, to some extent, and I am sorry that we do not come in contact with you to a greater extent than we do. (Applause.)

I believe that the solution of the personal injury question is going to be found in a closer relationship between the surgeons and the law department, in this respect, I mean: I believe that we are in the process of evolution in dealing with this problem. For instance, the situation is that the law department is called upon not only to handle the question of whether there is a legal liability, but in the great majority of cases to determine what the compensation should be for the injury sustained. Now, how are lawyers to know, how can they be expected to know except in the crudest form of injuries such as the layman can see, as the loss of an arm or leg or some objective form of injury—how are we really in a position to tell what the compensation should be for the injury suffered?

This question of compensation has, of course, an ethical side to it. I appreciate that all of us, when it comes to suffering an injury, would have the sensation that we would not care to take any compensation whatever in lieu of being restored to or kept in perfect health. But there is another principle involved, and that is largely the one of expediency. An individual has been injured, he is not in the same condition he was, and the law requires that there shall be some form of compensation. Speaking of the question of compensation, I am reminded of a story showing that there are some phases of illness which are not without compensation. It seems that in the streets of one of our large cities a gentleman was found lying apparently in an unconscious condition in the gutter, a number of bystanders came up and looked him over, and one man lifted his head and dropped it and said, "The fellow is very ill." And a cabman who was standing near said, "Sir, I wish I had half his complaint." The situation of rendering compensation for injury must be reduced to some form of law; I do not refer to the technical sense of the lawyer, but to some form of rule, and I want to ask your consideration of that proposition this morning. I want to make suggestions to you to see whether there is any possibility of the law and surgical departments developing some sort of scientific method of treating this condition.

As you know, in the past in the development of the common law the situation was very crude as to the standpoint of what compensation should be paid and as to what constituted liability. The law aforesaid is very crude machinery with which to deal with things of this kind. You know the principle of the common law is that he who contributes in any manner to his injury shall recover nothing. The situation is, then, that if an employe of a railroad company be injured while engaged in his work and he has been careless or negligent in any manner, contributing thereby to his injury, he under the common law is entitled to no compensation.

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On the other hand, if he has not contributed in such a way as to be regarded as having been one of the causes of his injury, the railroad company is compelled or expected to respond to him in damages for the amount that he has been injured. But when you look at that from an ethical standpoint, it is a very crude situation.

In the law of admiralty, where the court and not the jury passes upon questions of this kind, a new set of principles has grown up, that is, new in the sense that they are not in accordance with the common law. The principles there are that the court may require each party to contribute toward the payment in proportion to the contributing cause that he gave toward the injury. That is, if the employe was careless in some slight degree, if the employer was careless in a greater degree, then the court weighs the situation and attempts to do justice between the parties, so that a sum, after taking into consideration the negligence of the party who was injured, may be given to the party to compensate him. That is approaching an ethical state which the common law itself does not have. It is a recognition that it is crude to suggest that he should have nothing or that he should have everything; it is a suggestion that we ought to approach a point where we can if possible do justice to all our employes, whether or not they have been careless or negligent in contributing toward their injuries. The tendency of the times is in that direction.

You are doubtless aware of the Employers' Liability Act which was passed by Congress at its last session, in which they have done away with the so-called fellow servant problem which you have probably heard of in your relations with the lawyers of the railroad companies, and by which they have established what is known as the comparative negligence doctrine; that is the same doctrine which I have stated applies in admiralty cases. In other words, the law says that if the party injured has contributed to his injury, yet if his negligence be slight in comparison, while the negligence of his employer be gross, then the jury shall take into consideration the negligence of plaintiff in determining what his compensation shall be, but he shall not be barred in consequence. The constitutionality of that law is yet to be passed upon, it is now pending before the United States Supreme Court. But the tendency is in that direction.

I understand that in Germany, I believe, or at least in one of the continental countries of Europe, they have a system whereby there is arranged a regular schedule of rates for injuries suffered. Of course, that cannot be carried out to a point where injuries can be separated into distinct classes, but it is a basis, however crude, whereby the employer is expected to pay a certain amount, depending upon the injury suffered. You can see what that is leading us to. Two things have to be considered: First, the question of liability from the standpoint of the law; that is, from the standpoint of ethics, leaving out entirely the character of the injuries, leaving out entirely the question of what the suffering may be, what your prognosis of the case may be, leaving out entirely all that question, and leaving it to the lawyers to determine first what from the standpoint of legal ethics is the relative position of the parties? What relative proportion of the amount which ought to be paid for the injury, should the injured party carry, just as he would carry insurance? And what proportion ought the employer to take? After that is done the question is, what is the injury worth? This it seems to me is a question that has seldom been touched upon scientifically.

You gentlemen have written many books on medical jurisprudence, but in my experience I do not know of any specific work which deals with the question of comparative compensation for injuries suffered. Whether it is possible for such a work as that to be prepared, you know far better than I; you know far better than I whether you can classify in any scientific way the relative rights of compensation to people who suffer injury while riding upon railroad trains or working for railroad companies. It does seem to me, however, that a start can be made in the right direction.

Let me illustrate: About a year ago one of the railroads with which I am connected had a

severe passenger wreck. Traveling in one of the Pullman coaches at the rear of the train was a party of people who came from one of the retail stores in Chicago, buyers going to New York. There were four or five women and eight or ten men, I believe, in the party. The wreck was a very severe one from the standpoint of the number of people injured. They were all, however, injured in the forward cars of the train. In this Pullman car the only thing that happened was that a number of people were thrown down. One man claimed to have been thrown against the end of the berth as he was undressing, and the women especially claimed to have been injured. In other words, the injuries which they suffered were of such a character that it was difficult to determine what the situation really was, as the symptoms were all subjective in character.

The usual claims were made in the case of the women—the nervous system had been disarranged in some way. In a few instances surgeons representing the company had an opportunity to examine the parties making claims, in other instances they did not have an opportunity to examine them. In their reports to the law department, the surgeons differed widely as to the prognosis of each case from the physicians or surgeons representing the plaintiffs. What was the situation? The lawyers were easily able to agree on the question of liability; I talked with the attorneys representing these parties, and I did not have any difficulty in determining from the legal standpoint what the situation was as to liability, but when it came to the question as to what compensation should be paid, we were widely apart in every one of those cases owing to our mutual ignorance as to what would result from these injuries, assuming either that our people were right or that their people were right, that is, the physicians on each side. We had not any common basis upon which to determine the question of compensation.

So the matter dragged along, the cases got into court, they were on the verge of trial, and, as usual in passenger cases, they were eventually settled, not because we thought we were paying what we ought to pay, but because we sized the situation up and said to our company: "If you go before a jury they will give compensation out of all proportion to the injury, and it is better for us to pay a great deal more than we think we ought to pay so long as it is less than the sum the jury will pay."

You see how totally absurd that is from any scientific method of settling such cases. If we had some guide, if there were some means of comparing, in general classification, perhaps, this or any other character of injury, the lawyers would undoubtedly have been able to approach figures far more closely than they did. In other words, if it were possible for you to give us some scientific basis on which we could approach the question of compensation in dealing with settlements, I believe that there would be no more personal injury cases in the courts. I believe that the railroad companies desire to protect their employes, desire to see that they are fully compensated whatever may be the injury suffered by them, and that the tendency of the times is to ignore the question of contributory negligence. I believe the railroad companies are anxious also to compensate passengers, to protect them in the highest degree and to give them everything they ought to receive for any injury suffered. The great trouble, as I say, is that we are without any path to follow when it comes to questions of compensation.

Now I am going to approach with much diffidence the question, not of what the compensation should be, but as to whether there are any general rules to be followed. I know nothing about medicine, except this: Like law, I assume from your discussions it is not an exact science; you differ among yourselves a great deal as to methods and also as to the results that will follow from any particular injury or illness. Therefore it is impossible, it being an inexact science, to agree upon any basis that will more than approximate what I suggested, that is, relative questions of compensation. Taking the crudest kind of a case, the loss of a leg, it is easy for the layman as well as for the physician to determine in the long run what the injury will be, and there has therefore grown up in our courts what is known as the "price for an arm" or the "price for a leg." But when you reach conditions that the

layman cannot understand, when you reach conditions in which I am totally unable to see what the result will be, or, even after you have explained to me the result, what the condition will be from the standpoint of the inconvenience or of the health of the injured party in the future, then the layman is in a position where he cannot determine anything and the result is that the two lawyers, the one for the plaintiff and the one for the defendant, are totally unable to determine what the compensation should be.

Now, I ask you, gentlemen, is there any way in cases of the kind that I have suggested, that is, those that the layman cannot understand at all—is there any way for you to balance the situation so that you can approximate from the standpoint of expediency what the relative rules of compensation ought to be? If there is, and if you can explain these rules to us, you will help us and help the railroad companies a great deal in disposing of what is one of the most expensive items that the railroad corporations have, namely, taking care of personal injury cases.

And you will do another thing: As stated, I think the railroads are in process of evolution from the standpoint of management and operation; we do not come in contact with your department enough, and I believe if we begin to co-operate along these lines we will immediately see opening up before us fruitful paths in other directions that we can follow. Most of the relations that we, the lawyers, have had with you, the surgeons in the past, have been in the matter of becoming educated as to a particular case—the question of the defense of that case, the question of the proper form of questions and answers to ask the experts on the other side, attempting to cram into the lawyer little more than he may use for the time being with the hope of winning that particular law-suit.

I trust the time will come when we will get beyond that proposition, I hope the time will come when we will be co-operating together along the same lines to reach and correct this great evil, namely, the personal injuries which the railroads have to protect.

THE IMPORTANCE OF EARLY MASSAGE IN FRACTURES NEAR JOINTS.*

FERD. ENGELBRECTSON, M. D., CHICAGO.

In an article on "Massage in Trauma," published in the RAILWAY SURGICAL JOURNAL (March, 1907), is indicated the technic, indications and contraindications of massage, in fractures, contusions, sprains and reduced luxations. I will supplement that article by a plea for early massage in fractures which involve function in nearby joints and illustrate the technic on a fracture near the anklejoint.

The rationality of early massage in all cases of fractures which affect future usefulness of joints will be more clearly understood if we bear in mind:

First—That the injured tissues are built up by the cells, of which the parts involved are composed, and must be repaired by these same cells.

Secondly—That cellular activity like the activity of any individual depends on the supply of oxygen, nutrition and the proper elimination of the products of metabolism.

Thirdly—That the cell depends for these necessities solely on the blood and lymph which, if not properly circulating will not adequately supply its need in this respect, and thus reduce its activity which rather needs to be increased under these conditions.

We must not forget, too, that the activity of any tissue or organ represents the sum total of the function of the cells composing that tissue or organ. We may take for granted that with the cell in a condition of asphyxia, marasmus and intoxication, in greater or less degree, due to retarded circulation, we can not expect a beneficial cellular action in fracture, or any other condition.

Pathologically, we have always present more or less inflammation, extravasation and effusion retarding circulation in all tissues directly involved and in those distal to the injured

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parts. Ordinarily smooth surfaces become covered by irritating deposits, agglutinate and form adhesions; fascias contract, due to irritating substances which are not carried away, strangulating muscles, vessels and nerves: The natural results being faulty function of muscles, tendons and ligaments of joints after the fracture is healed.

Repair depends on cellular activity, and without improved circulation it must necessarily be slow, and in the meantime the vicious adhesions grow stronger and the contractures increase in degree. It is a well established fact that massage does prevent stagnation, adhesion and contractures. This action is due to the increased circulation and constantly repeated passive movement of the tissues.

In a fracture near the ankle, there is very often a rupture of the ligaments of the joint and a traumatic synovitis. If the circulation is not maintained properly, the capsule will become distended from intracapsular pressure, and if this is allowed to continue for any length of time, the interstices of the capsule are filled up by newly organized tissue and it has a tendency to remain enlarged permanently, thereby impairing strength and function. At least recovery is very tedious, even with massage if not started early.

In this connection, I wish to warn against using Bier's congestion treatment in sprains involving joints, I have seen this used in a sprain of the kneejoint, by means of an elastic bandage applied on the thigh for 3 hours every day tightly enough to arrest the venous and lymph current with the desired result of a passive congestion in the whole limb, and with this, a very marked distension of the capsule of the joint, which was not relieved by daily massage. The distension (of the capsule) became chronic due to newly formed tissue filling up the interstices. This prevented the normal contraction of the capsule after subsidence of the inflammation produced by the trauma, and leaving a saccular capsule almost irreducible by massage, or any other means, at best requiring a great many sittings and a long time to correct. If such treatment is desirable, massage must be injurious, the different proceedings being most directly antagonistic. I am also opposed to the very old practice in surgery, which is to encourage patients suffering from a fracture of the leg, to walk, sometimes before the cast is taken off at any rate before the muscles of the leg can be voluntarily moved.

The only force maintaining the venous and lymph current in the leg, opposing gravity, worth considering, is muscular activity. If that is lacking and the leg is kept pendant, gravity prevents the lymph and venous blood from ascending. This produces a state of passive congestion which even daily massage cannot overcome until the muscles of the leg have regained their function, in the meantime delaying improvement if not doing actual injury particularly if the ankle is involved. It is true this congestion favors the emigration of white corpuscles but of what advantage is this when there is no infection present. I realize fully the importance to the patient of moving about after a long confinement in bed but the obnoxious effects of such confinement may easily be prevented or relieved by general massage in addition to the local treatment.

A limb in which the muscles are not in use should be elevated most of the time to prevent passive congestion, because passive congestion means asphyxia, marasmus and intoxication to the cellular elements. It is obvious that venous blood and lymph retained in a part will act as an impediment to free access of arterial blood which thereby is directed to other parts offering less resistance.

The object of massage is, of course, to improve and maintain the circulation in the highest possible degree. This is the rational stimulation for the cells to promote the increased activity which is required to repair the damage of the trauma. The immobilization of the muscles, whose motion under normal conditions insure a good circulation, produces the necessity of some other means to take their place in this respect. And, barring contraindications, massage is the only means to be considered under these circumstances.

A Colles' fracture will show the best results if treated as follows: A well padded pistol-shaped splint is applied leaving the thumb and

all the phalanges free, patient being instructed to constantly flex and extend his digits. This splint is left on, not more than 7 days, then removed every day, massage and passive movement applied and the splint replaced. The splint is removed entirely after three or four weeks, and after this time there is very little to correct in the way of function. I have yet to see untoward results from this treatment.

In fracture of the leg near the ankle, the massage should commence as soon as the leg can be handled without disturbing the apposition, which is from 8 to 14 days.

The thigh is stimulated by stroking, kneading beating and passive motion of the hipjoint. After this, the cast is carefully removed, the leg is placed so as not to disturb the apposition, then carefully manipulated commencing proximally, gradually advancing toward the injury with alternate compressions and relaxations of the soft tissues with the hand, at first very superficially, later more deeply, carefully avoiding all movement of the fragments which are controlled by keeping one hand constantly over the place of injury so as to detect any movement. All irritation must be carefully avoided and the area directly around the fracture is not manipulated until a more solid union is accomplished.

These manipulations are kept up 15 to 30 minutes or until the tissues present to touch a uniform resilience and improved cutaneous activity evidenced by a perceptibly raised moist heat in the region worked upon. The cast is replaced and the treatment is repeated as often as needed. On account of the difficulty of removing the cast without disturbance to apposition it is not advisable to repeat the treatment every day, unless serious disturbance of circulation or general debility makes treatment every day imperative. Under ordinary conditions every second or third day will suffice at first.

After ossification has commenced and the fragments are fairly well united the seat of the fracture can be worked upon and passive movement of the ankle and knee may be commenced, at first in a limited range of the normal movement, gradually extending the same to full normal movement. Centripetal strokings may also be used about this time if there is no abrasion of the cuticle. If the continuity of the skin is interrupted, all antiseptic precautions must be observed, and the affected area covered by gauze saturated with an antiseptic solution, through which the manipulations are performed.

As soon as the union is solid, the massage should be given every day and more stimulating manipulations may be used, as kneading and rolling of the muscles and if required, friction over solid infiltrations or existing adhesion or newly formed abnormal tissues. Now is the time for the active movements—at first *without,* later *with,* resistance—to obtain and improve muscular control and strength. As soon as the patient has sufficient strength and control of his muscles he should be induced to walk in such a manner as to bring into normal action all the muscles, and if necessary special exercises for this purpose should be given.

In conclusion, when the distribution of the nutrients are in this way taken care of we should see that we have *something* to distribute, in other words, the blood should be enriched by nutritious stimulating food sufficient in quantity for the individual. This is best regulated by consulting the habits and taste of the patient and based on this, issue a special diet list.

The average hospital diet is more suitable for fever patients and dyspeptics than for, as in most cases, vigorous individuals requiring an additional supply of reconstructive material and it is my belief that if sufficient food is taken and properly assimilated we will be less dependent on special medication; but either is inadequate if not supported by a good circulation.

70 STATE STREET.

DEMONSTRATION.

In alighting from a street car this patient suffered a fracture of the tibia. The fracture was located in such a way that the nutrient foramen was involved. (I am able to show this case and the one following through the courtesy of Dr. Plummer.) After 7 weeks the doctor took off the cast and found no union at all, the fracture was practically fresh, and in consultation it was decided that massage should

be tried. When I first saw the patient there was a history of a large blood clot at the time of the fracture. The family history is negative, the lady herself in perfectly good health. I hesitated very much before undertaking this case, because in itself it was almost too complicated for massage. There was danger of producing an embolus at any time, but as it was I considered the nutrient artery was obstructed to such an extent that if nothing was done the leg would have to come off. I accordingly started in with massage, taking proper care as much as possible not to dislodge an embolus, and succeeded. I began 7 weeks after the cast was first set, February 18. In February I gave 10 treatments; in March 5 treatments, when the bone was practically solid; in April 2 treatments, and 2 later on, merely to accustom the muscles to the control of the will. The fracture healed under this treatment perfectly, and if any of you would like to see the site of fracture the patient is willing to exhibit it to you. (Patient exhibits fracture.) It does not show much of the fracture; sometimes in the evening there is a little edema, but very slight.

(The next patient, a young man, is shown.)

I will demonstrate as well as I can the methods of massage in cases of fracture in all the different stages of treatment, explaining the movements. (Patient lies down on table.) This cast was just taken off. On July 11 this young man was in a railroad collision, fracturing the tibia and the fibula near the ankle. I was called and gave the first treatment of massage on August 3. When the cast was taken off there was not a semblance of union; there was the same crepitation you would find in a perfectly fresh fracture. The history is positively specific, which explains it. During August I gave 10 treatments of massage; during September 7 treatments, and during October 9 treatments—26 treatments—and just during the last week the union has become a little more than semi-solid.

In the first place, when I treat a fresh fracture, I stimulate the muscles before taking off the cast, the object being to stimulate the circulation. I do this before removing the cast. After this I move the hip-joint, for the purpose of stimulating the circulation in the hip-joint. We will consider this a fresh fracture, without any union at all.

Q. Do you mean immediately after the fracture?

Dr. Engelbrectson: No, immediately after the fracture I would never give massage, but you will find very little difference in the bone 8 to 14 days after the fracture. There is a little agglutination of the segments in ordinary cases, and if there be any danger of complication in the joints we ought to start that early. So we will consider this fracture an ordinary fracture, with complications to be feared in the joint, say two or three weeks old. (Removing dressings.) In taking such a fracture as this out of the cast we will have to exercise great care. In the first place we will have to be ready to place the limb in such a way after the cast is off that there will be no bearing on any of the fragments, the fragments lying perfectly easy. We must lift it in such a way as not to disturb the apposition at all. That is very hard if not impossible to do without assistance.

The first thing we do is to place the hand over the fracture. This is to prevent any movement. In this case I was unable to do it. The first week I found slight crepitation in the fracture, no matter how careful I was. All I do in the first stage is to compress and relax the muscles with the fingers closed, at first very superficially, gradually as I can do so without disturbing the limb and without any force I go deeper, as deep as I possibly can without disturbing the apposition. I work this way all through the muscles, keeping it up until I get stimulating reaction which I notice by a slight increase of tenderness and a slight perspiration. After I get the tissues as elastic as possible, reducing the edema, I put the limb back into the cast. In that way I keep on treating it. The treatment lasts about 15 minutes, sometimes longer. For the first week I do not go near the fracture—I merely keep my hand there to prevent any movement. This I repeat, sometimes every day, sometimes every second or third day, depending upon the general condition of the patient.

Now we will consider that we are over the first stage. As soon as we get a semi-solid

union we can proceed to the second stage of the treatment, when we can knead the muscles. I still watch the fracture, taking care that there is no movement. I go deeper and knead the muscles just as I would roll a ball between the fingers and thumb. In getting the hand under I do not lift the limb much, but press the hand down. I do not rub on the bones. I see that every part of the muscle tissue is reached and reduce as far as possible any edema or infiltration that exists. This treatment is given every second, third or fourth day.

After the fracture is a little more solid, but still not entirely so, I start with movements of the joints. This varies in different individuals; sometimes three weeks after the cast is first put on, sometimes earlier, sometimes later, I start movements of the joints, watching all the time the fracture. I can also at this time give effleurage, or strokings, not disturbing the apposition. After that (we are still at a stage when the fracture is semi-solid) I move the ankle joint; fixing the lower end of the tibia and fibula, I rotate the ankle first in one direction and then in the other, then extension and flexion. Then I move the toes, fixing the tarsus, back and forth, then extend and flex them. After this I work through on the dorsal and plantar surfaces of the foot, reducing the edema here. In cases like this, where the skin is broken, I use a piece of gauze saturated in an antiseptic solution, wrap it around, and manipulate through this. I do not go near the fracture until the second stage, when there is semi-solid union. Then I go down over the seat of the fracture. There is a good deal of edema here which is due to the dependent position of the leg without use of the muscles. (In my paper this point is fully considered.) This is, of course, an unusually long time for a case to be treated, which can only be explained by the specific history.

Q. Was there any union there at the time you first saw it?

Dr. Engelbrectson: On August 3 there was no union at all; now the union is nearly solid, but the callus is very slight. I avoid irritation or pain as much as I can.

Q. Was he taking any treatment or inunctions before you began your treatment?

Dr. Engelbrectson: I was not giving the medical treatment.

It is almost too early in this case to illustrate the movements necessary to get control of the muscles, but the fracture is sufficiently solid for me to show you what I do in the finishing stage.

In the last stage, after the fracture is perfectly solid, I start with active movements. I first let the patient move it himself without assistance, then later on I offer sufficient resistance so that the patient can barely do the movement I ask him to do. In this case it is a little too early to start this treatment. Then I go through the movements of the ankle and knee in the same way, finally offering resistance to voluntary movement.

After the fracture is solid enough, I give the patient such exercise in walking as compels him to use every muscle. Walking in which the leg is simply a pendant member does not do any good. I insist that the patient shall walk in such manner as to use the muscles, and sometimes two or three exercises given for the purpose will prevent six months of limping.

Q. Was that a compound comminuted fracture?

Dr. Engelbrectson: No, it was not compound, the fragments were inside. These scratches were simultaneous with, but not from the fracture.

Q. Have you ever used Bier's compression in these cases?

Dr. Engelbrectson: Not in fractures. In the consideration of the treatment of joints I covered that point in my paper.

Q. Can one not get pretty good massage from the use of an ordinary vibrator?

Dr. Engelbrectson: You can in some cases, but you cannot direct it to any certain point, you cannot confine it to any certain point; you are liable to get stimulation where you do not want it, and it is impossible to get the kind of stimulation you want in certain parts. In the case of healthy tissues, where stimulation is needed the vibrator is all right.

A TABLE OF FIVE HUNDRED FRACTURES.*

S. B. MAC LEOD, M. D., CHICAGO.

My reason for presenting this small table of fractures is that I hoped some data concerning the character of the fractures occurring principally among iron-workers while at work, and produced largely by direct violence, would prove interesting.

I asked my assistant to pick out 500 cases from my somewhat incomplete records, but it was found it would be difficult to include the cases presenting multiple fractures (47 in all) so they have been omitted.

The data here given will represent I fracture to 1 patient, except in cases of fracture of radius and ulna, tibia and fibula, phalanges, metacarpals and metatarsals, ribs, vertebræ and skull, where though more than 1 bone is broken, yet surgically we can regard each as a single fracture.

The injuries referred to occurred in adult males, and were produced by falls, blows, being caught in machinery and the fall of heavy objects. In many of them, injuries other than fractures were present, so all deaths must not be attributed to the fracture alone. (I class as *comminuted* only those which were markedly so, and under *operations*, only those which were operated on for the fracture, excluding amputations.)

I will enumerate the cases in the order of frequency of their occurrence:

(1) Phalanges of the hand: 124 cases, 25 simple and 99 compound—52 right and 72 left.

(2) Tibia and fibula: 78 cases, 58 simple, 10 compound and 10 compound comminuted—9 of upper third, 23 of middle, 46 of lower—27 right, 51 left—10 required operation—and 22 were so-called Pott's fracture.

(3) Ribs: 50 cases, 49 simple, I compound—25 right, 25 left.

(4) Skull: 45 cases, 2 simple, 12 compound, 31 compound comminuted—10 basal, 7 temporal, 17 parietal, 9 frontal, 2 occipital—35 operations, 8 died.

(5) Radius: 40 cases, 36 simple, 4 compound—of middle third, 31 lower—24 right, 16 left—30 Colles'—1 operation.

(6) Phalanges of foot: 36 cases, 16 simple, 20 compound—16 right, 20 left.

(7) Metatarsals: 20 cases, 15 simple, 5 compound—8 right, 12 left—1 operation.

(8) Humerus: 13 cases, 5 simple, 3 compound, 5 comminuted—4 upper third, 3 middle, 6 lower—8 right, 5 left—1 operation.

(9) Femur: 13 cases, 5 simple, 5 compound, 1 comminuted, 2 compound comminuted—1 upper third, 9 middle, 3 lower—7 right, 6 left—3 operations, 2 died.

(10) Metacarpals: 12 cases, 12 simple—5 right, 7 left.

(11) Radius and ulna: 11 cases, 7 simple, 4 compound—1 upper third, 10 middle—8 right, 3 left—1 operation.

(12) Clavicle: 11 cases, 11 simple—11 outer third—2 right, 9 left—1 operation.

(13) Ulna: 8 cases, 8 simple—3 upper third (olecranon) 5 middle—3 right, 5 left.

(14) Nasal: 8 cases, 1 simple, 7 compound.

(15) Vertebræ: 6 cases, 6 simple—4 dorsal, 2 cervical—5 died.

(16) Patella: 5 cases, 4 simple—1 compound—1 right, 4 left—1 operation.

(17) Tarsals: 4 cases, 3 simple, 1 compound—I operation—(all limited to os calcis).

(18) Pelvis: 4 cases, 3 simple, I compound—1 operation—4 died.

(19) Fibula: 4 cases, 4 simple—3 middle, 1 lower third—4 left.

(20) Maxillæ: 3 cases, 3 compound—1 upper, 2 lower—3 right—2 operations.

(21) Zygoma: 2 cases, 1 simple, 1 compound—2 left.

(22) Scapula: 2 cases, 1 simple, 1 compound—1 acromion, 1 body—2 right—1 operation.

(23) Tibia: 1 case—1 simple—1 middle third—1 left.

The grand total shows 273 simple, 178 compound, 6 comminuted, 43 compound comminuted, 19 of upper or inner third, 63 of middle third, 99 of lower or outer third—192 right side, 249 left—62 required operation—19 died.

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

The occurrence by months was: January 38—February 39—March 44—April 40—May 48—June 50—July 54—August 30—September 44—October 23—November 47—and December 43.

The 47 cases of multiple fracture which were omitted while collecting the above, presented 123 fractures which totalled as follows: 9 Radius—15 Radius and Ulna—10 Tibia and Fibula—4 Clavicle—5 Ribs—17 Skull—21 Femur—13 Humerus—5 Phalanges hand—2 Phalanges foot—2 Metacarpal—3 Metatarsal—4 Maxilla—1 Pelvis—2 Patella—1 Vertebræ—4 Nasal—2 Tarsal—1 Carpal—and 2 Malar.

I might mention that I have noticed a certain periodicity in the occurrence of these fractures, a week or ten days out of every four or five weeks will bring me practically all the fractures I see during that period, and although I have tried to discover the determining factor, I feel that I have not yet done so. I mention this with the hope that some of you may be able to relieve my natural curiosity regarding this observation.

SOME OBSERVATIONS ON THE EAR.*

J. E. MINNEY, M. D., TOPEKA, KANS.

"Prevention" is the shibboleth, the countersign, the watchword of the successful practitioner of medicine and surgery of today. This applies to the body as a whole, and to the special organs of sense in the order of their importance.

In the business world the importance of an organ is determined by the necessity for its use. The railroad surgeon must learn if the applicant for a position in the service is a normal man, but particularly if the special senses of hearing and seeing are normal. And not only do they functionate now, but from their shape or from some pathologic condition present, will their function soon be interfered with to such an extent that the applicant will be unfitted for duty and if so what are the signs or symptoms present, giving notice or warning of interference or impending danger? And what is the duty of the railroad surgeon in these cases, and what can he do to ward off or relieve the threatened danger to these organs and save a good man to the service, and incidentally be of service to the general public?

The ear being the topic of discussion, the answers to the foregoing questions are:

(a) In a large percentage of cases the danger *can* be *recognized* early by the symptoms present, and your attention will be called to them later in the discussion.

(b) It is the duty of the surgeon to find out the abnormal condition present (the earlier the better for the applicant) and in a large percentage of cases good men can be saved to the service.

The normal ear has an excess of, or a superfluous amount of hearing. In senile or pathologic changes in the ear this excess or superfluous hearing is first lost, and unconsciously to the patient. Then follows the perceptible or conscious loss or dullness of hearing.

In this class of cases preceding or in addition to dullness of hearing there is often tinnitus aurium and there may be vertigo. The noise may be described as a constant ringing; a puffing like a locomotive, or the escape of steam; a throbbing sound with each pulsation of the heart; a clicking; a sound like the soughing of the wind in the trees. The patient's own voice may sound to him hollow or like talking in an empty barrel or cistern, or as coming from a distance. A stuffy feeling or sensation is complained of in the ear and there is a desire to rub or pull the ear to relieve the unpleasant sensation. The dizziness may be continuous or intermittent. There may be a dry, hacking cough. There is often some tenderness of the ear felt on pressure and in opening the jaws as in yawning. Pressure of the ear on the pillow causes a dull, heavy, uneasy feeling or sore sensation, and the head is turned from that side or gently pressed on the pillow to retain the warmth in the ear. Inflation of the middle ear in blowing the nose, or by other methods, calls attention to the ear by the uneasy sensation or pain caused by the air suddenly pressing the drum-

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

head out or by the movement of the ossicles, or both.

With some, many or all of these symptoms there is evidence of middle ear catarrh. A pathologic condition is present in the middle ear. By the middle ear is meant the Eustachian tube, the tympanum and the mastoid. One or more of the parts of the middle ear are involved when the symptoms enumerated are present. With such a history a careful examination should be made of the ear and its adnexa, the nose and throat; and an inquiry made into the general physical condition, business and habits of the patient.

There is a general impression that but little if anything can be done for the relief of middle ear catarrh, and especially when the function of hearing is interfered with. This is true if the catarrhal inflammation is permitted to run its course with no or improper treatment. But it is not true if the disease is recognized early and proper treatment given. An early diagnosis and proper treatment will restore the hearing, stay the disease, or render the patient comfortable.

To see these cases early the laity must be educated to the danger of delay to the function of hearing. The family physician is the teacher. The responsibility rests on him to tell his patients the danger of neglecting these ear troubles in persons of all ages, but especially in children and young persons.

EXAMINATION.

The railroad surgeon tests for normal hearing. Hearing is said to be normal when the applicant can hear the whispered voice or watch or audiometer 20 feet distant, with first one ear open and the other ear plugged, alternately. An examination should be made also with the watch, the tuning fork and the audible voice.

With the tuning fork both air and bone conduction are tested. If air conduction only is interfered with the conducting apparatus is at fault, and the trouble is in the middle or external ear. Such persons often hear better in a noise, such as on a moving train. If bone conduction is interfered with the receiving apparatus is at fault,—the auditory nerve.

Having learned that there is a dullness of hearing by the foregoing tests the ear is inspected, noting any asymmetry or deformity. Pressure is made on the tragus and below the ear inward on the canal. The auricle is pulled gently outwards, backwards, forwards, up or down to straighten the canal. This manipulation will help to locate the tender area if any.

With the head mirror and speculum the auditory canal and outer drumhead are seen. Particular attention is given to the appearance of the drumhead, noting:

(a) The color, if of a pinkish white life-like color or the dead, dry, ashen appearance of catarrh.

(b) The cone of light is observed as a matter of routine practice. Its absence may mean nothing, but taken in connection with other objective symptoms is of some value.

(c) The retraction or bulging of the drumhead.

(d) The prominence or recession of the head of the malleus and its long process.

With the Seigel speculum the flaccidity of the drumhead can be determined and pain elicited if an active inflammation present. In lieu of a Seigel speculum have the patient take a good breath and hold the nose and mouth shut and blow, thus filling the ears (Valsalva's method), or use the Politzer air bag and note the position of the membrane after inflation *and injection*. An examination is next made of the mastoid by inspection and pressure, although at this stage of pathologic change no perceptible symptom is present in the mastoid.

Having learned the patency of the Eustachian tube fairly well by former inflation, an examination is made of the nose, mouth, throat and pharynx, especially the vault of the latter. A high arched palate means nasal trouble. Hypertrophied tonsils and turbinates, with the presence of adenoids, and deviated septum mean catarrh of the head. Three-fourths, probably, of ear troubles are catarrhal and have their origin in the adnexa and are conveyed to the drumhead through the Eustachian tube.

It is essential to know if the patient is a mouth breather, for nasal breathing must be established before a cure can be made.

TREATMENT.

If impacted cerumen is present it should be removed by syringing with warm water and the ear dried. This will also stop the ear cough.

Impacted cerumen is the forerunner or result of an over excitation of the ceruminous glands and this in turn by a catarrhal trouble of the tympanic cavity. An examination of the nose, throat and middle ear of such a patient should be made at the same time that the ear is cleansed.

If the visible cause is present the patient should be told what treatment to pursue. If there be no visible cause the patient should be told the usual cause of the excessive accumulation of ear wax and that he should call two or three times during the year for examination, as a precautionary measure.

Impacted cerumen may be mistaken for aspergillus. Such a mistake is of short duration. If the ear is cleansed and the patient returns in a few days complaining of dullness of hearing and a stuffy feeling in the ear and there is an accumulation in the canal, it is a case of aspergillus. The microscope will prove the diagnosis. Ordinarily ear wax is washed out with but little manipulation, at least when the canal is dried it looks clean. When aspergillus is present the wax is sticky and more or less ropy and after cleansing and drying, the canal or drumhead, or both, look soft and more or less flecked with grayish masses.

In obstinate cases of cerumen several sittings will be necessary to remove the wax and there will be an oozing of serum and blood from the surface of the canal, it being denuded of its epithelial covering. In such cases after drying the surface carefully with cotton a little bland ointment should be applied, such as cocaine 1 grain to the ounce of vaseline, or 1 grain each of cocain and the yellow oxid of mercury to the ounce of vaseline, and the ear should be plugged with cotton when the patient leaves the office and the patient told to take the plug out when in doors for the night, and leave it out next day unless the ear calls his attention to it.

In case of aspergillus, after the ear is cleansed and dried carefully swab it with a 95 per cent solution of alcohol or put enough alcohol in the canal to cover the affected area and let it remain a half or a minute, then dry the ear; or use a 10 to 20 per cent solution of nitrate of silver. Either of these may have to be repeated a few times. Moisture and grease favor the development of the organism. Aspergillus is not of catarrhal origin, although a discharging ear favors its development. A foreign body in the auditory canal is sometimes the nidus for ear wax, but it is the exception. With a catarrhal involvement of the middle ear, if the tonsils are enlarged, they should be removed; also adenoids and spurs from the septum. Sufficient of the turbinates should be removed to give free drainage and æration. Proper drainage and ventilation of the middle ear are essential to maintaining its function. The middle turbinate is the one princpally at fault in middle ear troubles and a section of its anterior surface should be removed, especially if it infringes on the septum.

However, the indiscriminate removal of the turbinates is to be condemned and it is the exception that the making of large windows or openings in the septum is justifiable.

Free drainage and æration are compatible with large turbinates and only should there be active interference with them, when it can be seen that pathologic conditions warrant. Unless there is a marked deviation from the normal in this class of middle ear troubles a trial should be made with the spray, inflation of the middle ear, alteratives, diet, dress, habits and nose breathing.

The typical spray apparatus for the patient is the DeVilbiss No. 9. The typical fluid to be used is menthol, camphor and oil of cubebs of each drams *ss.*, alboline sufficient to make an 8 to 12 oz. mixture according to the sensitive condition of the mucous membrane. One-half teaspoonful should be sprayed in the nose and throat twice a day or more frequently if an operation has been performed on the parts. In spraying the throat the end of the tube should be put in the patient's mouth, the mouth should be closed and the patient take a slow deep inhalation, withdraw the tube and exhale through the nose. A greater surface of the

mucous membrane is reached in his way than by holding the tongue down with a tongue depressor. If the middle ear is involved the patient should be instructed while the lungs are full of the spray to fill the ears gently by the Valsalva method, or a Politzer if they have one. If but one ear is involved they should hold the tragus of the well ear firmly against the canal of that ear so its drumhead will not be pushed out and an irritation set up in the good ear. They should be cautioned specifically against over or too frequent inflation. Once or twice a week is ordinarily sufficient if the tube is fairly patent.

A typical alterative is one hundred 1/10 grain tablets of calomel, 1 tablet to be taken three times a day after eating, or 1 grain of the iodido of potassium instead, or alternate. Thirty days of such treatment will relieve or improve the patient or determine what further should be done.

A mixed, regular, moderate amount of food should be taken, well masticated and slowly eaten. Meat should be eaten sparingly, especially those meats which increase uric acid. An irritable kidney is unfavorable to a healthy mucous membrane. The dress should cover the body and be uniform in its protection. The habits must be regular. The patient must breathe through the nose.

With mild stimulation with the spray, as suggested, keeping the nose clean by this spray, nose breathing and a mild alterative the turgid mucous surface will often shrink and become normal, the ear be restored to its normal function or relieved of the distressing symptoms. The principal sewer system of the body, the alimentary tract, should be kept rather freely open. The success attending this plan of treatment (not new) is worth trying.

Surgical intervention is often avoided to the great relief of the patient and to the greater credit of the physician.

The use of the Eustachian catheter has not before been mentioned, although it has its place in the treatment of the middle ear. Some prefer it to the Politzer air bag. In case the auditory nerve is at fault the prognosis is more guarded.

If of specific origin the treatment must be systemic, local treatment is but little if any use. If the cause cannot be learned and treatment is given it is wholly empirical. However, the general health should be looked after the same as outlined in the foregoing discussion.

CONCLUSIONS.

1. Dullness of hearing and deafness is caused by middle ear catarrh in probably 80 per cent of the cases.

2. Catarrh of the tympanum primarily is the exception.

3. The origin of middle ear catarrh is secondary to diseased tonsils, adenoids and catarrh of the nose and pharynx in probably 90 per cent of the cases.

4. Dullness of hearing or deafness can be prevented in a large percentage of these cases if recognized early and proper treatment given.

(a) By dullness of hearing is meant such a loss of hearing as to put a man out of the railroad transportation service or to seriously interfere with him where he has to deal directly with the public.

5. The family physician is in position to educate his patrons to the danger of delay in these cases, and is in a measure responsible for the neglect, if he does not inform them and serious results should follow.

6. Mild means should be used in the treatment of incipient middle ear catarrh, unless there is marked or unmistakable indications for resorting to radical measures, such as diseased tonsils, adenoids or hypertrophies obstructing drainage or ventilation of the ear or its adnexa.

7. The indiscriminate removal of hypertrophied turbinates is condemned.

8. Of the turbinates, the middle one is the principal offender in catarrh of the middle ear.

9. Over-inflation of the middle ear is harmful, and in ordinary cases the ear should be inflated but once or twice a week; and if but one ear is involved, a column of air should be held against the normal drumhead by pressure on the tragus, thus closing the auditory canal and preventing the over-distension of the normal tympanic membrane, and excessive stretching of the ossicular joints.

TONSILAR HYPERTROPHY AND THE MIDDLE EAR.*

F. E. V. SHORE, M. D., DES MOINES, IOWA,
Oculist and Aurist Rock Island System.

I had intended dealing with catarrhal affections of the middle ear resulting from diseased tonsils and the treatment of enlarged tonsils. I intended to briefly state the treatment of the chronic catarrhal affections as being unsatisfactory and leave my friend, Dr. Andrews, to tell you of a very satisfactory method that he has of dealing with them. As the time is quite limited I will merely describe the tonsillectomy. I described this in the April number of the *Iowa Medical Journal* some time ago, but I have made several important changes in that respect, so I will describe my present tonsillectomy.

With this conception of the importance of the faucial tonsil we take up the consideration of the most expeditious manner of dealing with the offending organ.

The method of partial amputation by the curved bistoury, or the ingeniously devised instruments of Mackenzie and Mathieu, have prevailed for a lengthy period of time; and even now is the method usually adopted. It is easy and rapid of performance and gives, in most cases, a measure of relief sufficient to satisfy the immediate requirements of the patient; but it lamentably fails in producing permanent relief from many of the annoying symptoms and sequelæ; and at no time does it leave the fauces in a normally healthful condition. The instrument is not sufficiently under control to insure the removal of the desired amount of tonsilar tissue, or to avoid injury to the pillars of the fauces, superior tonsilar plica, or important surrounding vessels. The retention of a portion of the tonsil results in reinfection through the crypts and lymph channels, with hyperplasia and recurrence of the hypertrophy, peritonsilar abscesses and infections of the tympanic cavity, mastoid and cervical lymphatics. With a painful realization of such untoward results so uniformly following apparently successful tonsillotomies, I decided some three years ago to abandon the partial operation for the complete excision, and although my earlier efforts were not uniformly successful, they were sufficiently so, and the results so gratifying as to encourage me in perfecting my technic so as to perform at all times a complete and expeditious excision of the tonsil, whether it was prominently presenting or deeply imbedded.

One of the most important considerations in the excision of the tonsil is the prevention of hemorrhage during the operation. This is best accomplished by the free local or hypodermic use of one of the suprarenal preparations. The operation is performed under general anesthesia in children and nervous adults; but 20 per cent of cocain locally with a slight amount of a 1 per cent hypodermically suffices for the average adult. A number of gauze sponges in artery forceps having been prepared, the patient is given the general anesthetic in the ordinary horizontal position, and at no time during the operation is the position changed except to occasionally turn him on his side so as to favor the escape of blood from the throat and mouth. At no time is it necessary to suspend the patient for drainage purposes or prevention of laryngeal obstruction. While the anesthetic is being given an application of a 4 per cent solution of cocain to the fauces materially assists in quieting reflex excitation during the progress of the operation. A few drops of a 50 per cent solution of suprarenal extract are injected at the upper and lower poles, well toward the external surface of the retracted tonsil.

A Whitehead mouth gag is now introduced, the tongue depressed and gentle traction made on the tonsil by the vulsellum previously applied. An incision is made through the mucous membrane from the posterior pillar along the free tonsilar surface toward the anterior, great care being taken to avoid injury to the superior plica or membranous fold. The incision is now carried to the inferior pole of the tonsil as close as possible to the follicular openings, so as to retain the greatest amount of mucous membrane possible. Gentle traction having

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

been continued the membrane is grasped in a pair of forceps and together with the anterior pillar dissected from the tonsil. The dissection is carried under the arch to the posterior flap which is raised with the posterior pillar similar to that with the anterior. The vulsellum is re-applied to the upper portion of the tonsil, and while gentle traction is exerted, the tissues binding the capsule of the tonsil to the deeper structures are rapidly divided with a short round-pointed knife closely applied to the capsule.

As the dissection proceeds toward the inferior pole the traction forceps are re-applied as often as necessary to produce a rolling out of the tonsil sufficient to obtain a free inspection of the field of operation at all times. As the operator approaches the lower portion of his dissection he is greatly tempted to sever the remaining attachments with one sweep of the knife, and especially is this the case if a sharp bleeding occurs; however, it is quite essential to continue the dissection until final separation occurs. It would seem from His investigations of the human embryo that the thyroid gland is related to the formation of the root of the tongue and tonsils, and it may be, their functions in later life are similar. I have entertained the opinion that the lymphoid tissue surrounding the lower portion of the tonsil may possess a structure or structures similar in function to the para-thyroids, the removal of which seemed to have a very marked effect on the system and as a consequence I have satisfied myself laterally with the excision of the tonsil without the lymphoid tissue.

If there are any spurting vessels they should be caught up and in children pressure with the sponge will suffice to arrest any general oozing that may occur. In adults free hemorrhage has occurred sufficiently often to give rise to very annoying if not dangerous conditions; so that as a precautionary measure in all adult cases I pass two sutures through posterior and anterior pillars and approximate the denuded surfaces, leaving the stitches in place 24 hours. They not only completely control the hemorrhage, but by approximating the pillars, place them more nearly in their normal position. The stitches are readily removed and the attachments between the pillars so slight that practically no hemorrhage occurs in their easy separation. The introduction of the stitches is quite difficult, but I have largely overcome this in a needle I have had made for the purpose.

The operation requires a thorough knowledge of surrounding parts, trained assistants and a rapid operator, as it is always difficult to maintain a continuous anesthetization in tonsilar cases. One to five minutes will usually be required for the dissection of each tonsil.

These patients should not be permitted to pass out of close observation during the first 24 hours, but if possible should be put to bed in the hospital. Any topical application desired may be applied, and the mouth kept as thoroughly cleansed as possible until the completion of cicatrization, which occurs in about two weeks.

The cavity formed is very extensive and deep and for a few weeks affords lodgment for particles of food, but it soon becomes largely obliterated, leaving a normal smooth surface in place of the ragged, diseased and dangerous mass which formerly occupied the cavity. The pillars are free to act with co-ordinate muscles. Alterations of the pharyngeal, Eustachian and tympanic mucous membranes follow, followed by a marked improvement in the purity and pitch of the voice and audition.

Fluid is not uncommonly found in hernial sacs. It may either be of normal character, such as is secreted by the peritoneum, or it may be abnormal in kind and amount. Local inflammation of the peritoneum forming the sac will give rise to an excess of fluid from which deposits of lymph are apt to occur. Ascitic fluid from the general peritoneal cavity may also descend into a hernial sac, and when this condition complicates a hernia, it is equally impossible, as a rule, to keep either the viscera or fluid reduced.—*Eccles.*

Taking all ages and all varieties of hernia, the *proportion between the two sexes* is probably about six males with hernia to one female.—*Eccles.*

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Subscribers not receiving their Journal regularly will confer a favor by reporting the non-receipt to the editor.

ANNUAL MEETING.

The fifth annual meeting of The American Association of Railway Surgeons will be held in Chicago, October 14, 15 and 16, 1908.

THE SOLUTION OF COLOR BLINDNESS.

Dr. J. A. Denny, Medical Director of the C. B. & Q. R. R., submits the following solution of the question of color blindness to which his attention was called by a friend. The letter reached the office of the Division Superintendent of the L. E. & W. from a section on the line and is as follows:

Montmorency, Ind., Feb. 31, 1907.

Iy Inspector—Dere Sur—The day before yisterday at nune I got word to cum down and have me ise looked after fur colr blineness. I had 45 tise and 10 rales to put in beyant the sand cut and me hands were to short to spare me. The iy that was first in me, was put out by a blow from a pik and me glas iy is a perfect figger of the iy that was not put out, and is sent to you and me watch for examination. I cud spare the glass one better than the one in me head. If she is colr bline Ill get one that aint.

Anthony D******* Foreman, Sec. 10.

AN IDEAL RAILWAY SURGEON.

A professor of surgery has recently been appointed in an eastern college, who we are informed comes "well prepared for the position he is to occupy. The college is very fortunate in securing the services of a man with such preparation and experience for the professorship of surgery."

Now, as to some of the qualifications: In 1899 he made a thorough study of tropical diseases in Japan, Hong Kong and Manila. In India he saw "one of the worst epidemics of bubonic plague that the empire had ever experienced." In 1901 he took charge of cleaning up Chinatown in San Francisco. He has written numerous articles and monographs. For example, "Notes on the Distribution of B. Coli Communis," "The Angiogenesis, Organogenesis, Histology and Angiology of the Adrenal," "On the Use of Clay Models in Anatomy." He is a member of the Morphologische-Physiologische Gesellschaft of Vienna, also a member of the Sigma Xi.

What ideal qualifications for a railway surgeon!

Translations

FRENCH SURGICAL CONGRESS, SESSION, 1907.

CHRONIC SURGICAL AFFECTIONS—TUBERCULOSIS AND CANCER—IN THEIR RELATIONS TO ACCIDENTS TO WORKINGMEN.

(Continued from page 241.)

2. CANCER, PAUL SEGOND, M. D., PARIS.

Translated for THE RAILWAY SURGICAL JOURNAL.

Under the terms of the law, in order that there may be an indemnity in a given case of cancer, we cannot take into account the influence of *slight and repeated traumas* or of any *prolonged irritations* whatsoever, for which certain trades are so clearly responsible. We can only consider one condition, where there has been *an accident,* that is to say *"a corporeal lesion proceeding from the action of an external and sudden cause, occurring in the course or on the occasion of labor."* It is understood, then, that I shall not occupy myself with the question of cancer from the x-rays, nor with smoker's or chimney-sweep's cancer.

I have undertaken some bibliographic researches with the aid of MM. Jeanbrau, Lenoir and Sachet, in order to collect the cases of cancer due to trauma. We were able to discover 600 observations, 356 of which were considered by their authors as having indisputable clinical value. Now in our opinion not one of these cases is absolutely convincing, and nearly all of them are incomplete. Especially is the condition of the wounded region before the accident not alluded to, and many of them are besides equally silent as to the degree of violence of the trauma, its exact date, that of the appearance of the tumor, its histologic examination, etc. We may say, that leaving aside cases of epitheliomas grafted on pre-existing lesions—scars, ulcers, nevi, there is not a single undoubted case of traumatic origin in the whole 356 cases.

I addressed a circular letter to some 600 surgeons in France and elsewhere, and as a result a series of cases has been sent in by different confréres. First of all, there are 8 cases of epithelioma grafted on old scars or on ulcers; but as there is no question here of recent trauma these have no interest at present. Next is a case related by Lapeyre in which epithelioma of the lip followed a prick from a thorn, and 5 of epithelial cancer, developing after contusions, sent in by Kallionzis (Athens) who believes in the possible traumatic origin of these, or at least that "the patients possessed a hereditary or acquired predisposition to neoplasms." Lastly I owe 13 cases of sarcoma (to which I can add a personal case) to 10 of my colleagues. Of these 14 cases of sarcoma, 7 are especially demonstrative as showing the influence which trauma exerts on the development of such tumors.

As a result of this enquiry by circular letter, we must in the first place realize that up to the present, there is not a single striking observation indisputably demonstrating that trauma may be the determining cause of cancer. And notwithstanding, it is none the less certain, that a number of cases carefully observed, give the proof, at least chronologic, that external and sudden violence may serve as a pretext for the outbreak of a malignant tumor, so one is constrained to concede to the trauma, the value of a cause—not determining, but occasional. In short in the cases where the chronologic chain of events seems to best demonstrate the influence of a trauma, the latter is fallacious. Consequently, we should infer that no wounded person can become cancerous, following and as a result of an accident during work, if he is not already exposed by heredity or markedly possessed of a cancerous diathesis. The demonstration of this is of no value from a medico-legal standpoint, and when this predisposition, has no other proof than our theoretic considerations, when, in a word, it is *latent,* the courts have the right to be guided solely by the fact whether there was any responsibility or not.

The second result furnished by the circular letter, is to prove unmistakably, the alleged traumatic origin of sarcoma much more often than for other varieties of tumors.

As regards the influence of trauma on a subject already cancerous, we may conclude traumas, as a general rule, do not appear to acquire

any particular seriousness from the single fact they are inflicted on a subject already the possessor of a cancerous tumor. It is certain, that if these cancerous individuals are not cachectic, operative wounds inflicted on them heal normally and fractures unite very quickly.

Concerning such cases as those in which the trauma has no effect save to *reveal* a pre-existing tumor, and in which the trauma *aggravates* the growth, they are too well-known to need any further discussion.

The application of these clinical findings to the medico-legal study of post-traumatic tumors, enables us to conclude, that the great majority of cases in which the claimants or their representatives assert the cause to be an accident during work, are in reality, nothing but tumors preceding the trauma and revealed by it. In a certain number of cases, again, the trauma may aggravate the cancer and apparently start renewed growth. Hence it is just, as well as humanitarian, to allow damages to be recovered.

1. For subjects who have been injured while in apparent good health and in a healthy region of the body, with the proviso that the post-traumatic tumor present with the following guarantees—authenticity and sufficient importance of the trauma, evident integrity before the trauma of the locality involved, a lapse of not over two to three years between the accident and the appearance of the tumor, histologic verification of the lesion.

2. For victims of accident who were already cancerous at the time, when it is proved that the trauma aggravated the pre-existing neoplasm, or again, where it has predisposed to cancerous degeneration by wounding some lesion more or less prone to cancer—an old scar, callus, ulcer, fistula, fibroma or nevus.

3. DISCUSSION.

M. Thiem.—Wounds primarily healthy may sometimes become tuberculous by direct infection and transformed into tuberculous ulcers if they are situated superficially, while if deep-seated they may become contaminated from tuberculosis of the neighboring tissues. On the other hand, traumatic wounds form in certain cases, the entrance for tuberculous infections of the organism.

In other conditions, many cases of traumatic tuberculosis may develop following simple contusions, infection being carried through the lymph or the blood current. Moreover, a trauma, no matter how slight, is susceptible of lighting up the activity of a tuberculous focus actually cured, and of course, is much more capable of aggravating a pre-existing local tuberculosis.

As concerns cancer, I believe the irritative causes should have some influence in the development of malign tumors. Notwithstanding the trauma may be only the indirect cause—and under exceptional conditions—of the production of a neoplasm. It is certain that the great majority of cancers arise unconnected with any trauma, but the real cause of cancer still remains obscure, and accidents to workingmen should not suffer as a result of our imperfect knowledge. It must be admitted that in certain rare cases—extremely rare, to be sure—trauma may constitute a factor in the evolution of neoplasm.

M. Schwartz.—In the number of cases under my own observation, I have never seen one of post-traumatic tuberculosis resulting from a subcutaneous trauma, unless there was pre-existing tuberculosis; a wound alone is possible of becoming the starting point of tuberculous infection.

Among malignant tumors, the sarcomas appear in a certain number of cases, to really originate through trauma. As to epithelial growths and trauma it is rather difficult to establish any connection between cause and effect, at least in the present state of our knowledge.

M. Giordano.—With the present ignorance of the cause of cancer I do not think any influence can be shown for trauma in the development of epitheliomatous tumors, save possibly the implantation of grafts, and I believe the relations of trauma to tuberculosis should demand more of our attention. Inoculation of tuberculosis through an accidental wound is undoubted, and the consequences of this inoculation may become far-reaching, for it may be the starting point of

infection in a family hitherto free from the disease.

M. Tédenat.—It is certain as M. Jeanbrau remarks, there are tuberculous lesions in many individuals the development of which may evidently be accelerated by trauma.

Concerning tumors, a trauma appears to be capable of becoming the starting point of sarcoma, but there are also sarcomas which develop without giving rise to any pain and which may cause spontaneous fracture on the occasion of some trivial trauma, which is very difficult to establish.

Lastly it seems to me that traumas should also be thought of in connection with epithelial cancers.

M. Malherbe.—Sarcoma seems to be rather frequently caused by trauma, if one can judge by a dozen cases under my care, in which there was a well-marked history of trauma before the appearance of the tumor.

It is not the same for epithelial cancers, and I do not know of a single case in which a tumor of this nature became manifest after a violent trauma. On the other hand, I have many times seen epitheliomas arise about old scars, especially those from burns.

Lymphomas and lymphadenomas may also appear as the sequel of trauma, I have seen cases which appear indisputable to me.

M. Estor.—Out of 372 cases of tuberculosis of the bones and joints under my care, I found 36 in which trauma played some part. As a rule the trauma was slight, and 14 individuals of the 36 merely fell their own length. In 10 of the cases there were tuberculous antecedents. Lastly, in 7 patients there were tuberculous manifestations before the accident. Whether the trauma reveals the tuberculosis or aggravates it, the development of the lesions caused by it is especially rapid and in many cases it rapidly leads to suppuration.

M. Doyen.—There is no doubt tuberculosis may follow trauma. I have seen a good example of this—tuberculosis of the elbow in a carter who was bitten by his horse. In this case there was evidently direct inoculation.

Referring to the relations of trauma to cancer, I may cite you an adenoma of the mammary gland, which I had under observation, and which developed at the exact spot where the patient had been struck by a tennis ball some months before.

M.Remy.—In 2,500 cases I found but 37 of tuberculosis, of these 3 were cases of direct inoculation attributable to accidents during work, in another case there was inoculation of an accidental wound from the tuberculous wife of the patient. I have seen but 3 fractures ultimately followed by tuberculosis.

As regards doubtful cases, where the trauma has either been slight or is not proved, they are more numerous, and I have myself seen 18.

M. Thiéry.—There are but very few instances in which a medico-legal examination has been made of tumors apparently following trauma. In over 400 of the ones made by myself I found but 1 case, and I may add that in this one the idea of the relation of cause to effect was rejected.

If cancer can be of traumatic origin it would have to be much more frequent in young subjects than in the aged.

Hence, I believe, in the present state of our knowledge, excepting sarcomas and epithelioma grafted on old cicatrices, there is merely a coincidence between trauma and cancer.

M. Coudray.—Out of 250 cases of surgical tuberculosis, I found but 14 in which one could really invoke trauma as capable of influencing the development of the tuberculous lesion. Of these 14 cases 2 were cases of coxitis, 6 of tuberculosis of the knee, 2 of the ankle, 1 spina ventosa, 1 of the wrist, and 2 of the elbow. In all these cases after careful examination I reached the conclusion that the blow, the fall, in a word the trauma, had no other result than to reveal pre-existing lesions, by many times aggravating them.

Consequently I persist in my opinion, already stated, that trauma never creates a tuberculous lesion save those cases of tuberculous inoculation of a wound. We should then, in my opinion, take into account pre-existing conditions in legislation relating to tuberculosis.

M. Vanverts.—I forwarded 2 cases of sarcoma following trauma to Professor Segond. The first concerned a little girl of 6 who sustained a fracture of the femur in the middle third, without any reason to suspect any pre-

existing disease of the bone. The fracture united as usual and the child was able to walk again. Three months later on the child received a fall, the site of the fracture became painful and a rapidly developing osteosarcoma made its appearance.

The second case is an instance of a nevus on the forearm in a man of 44 becoming sarcomatous as the result of a blow. The latter had for an immediate consequence suppurative inflammation of the nevus, and the sarcoma made its appearance soon after.

M. Moulonguet.—I believe that errors are sometimes committed by the medical experts, because the first certificate delivered soon after notification of the accident, may be inscribed with a diagnosis of "contusion of the elbow," for example. The first doctor called in simply finds pain, swelling, and sometimes a little redness and supposes he has to deal with a transient lesion due to the trauma, while as a matter of fact he is confronted by tuberculosis of the elbow unconnected with trauma. Errors of this nature surely must be rather common, and there are certainly numerous abuses arising from the undue importance given to the relations between trauma and tuberculosis. It is necessary to be conservative in the consideration of these relations, and not to exaggerate them.

M. Vidal.—I realize that trauma may give an impetus to the development of a neoplasm, but on the other hand, there are cases, apparently paradoxical, in which trauma may cause temporary regression of cancerous masses. I have myself seen 4 cases of this nature, all involving the mamma. It is rather difficult to explain these cases—it is probable that such regressions are partly due to absorption of toxins and partly to the rise in temperature, which was seen in all 4 of my cases.

M. Lapeyre.—I sent M. Segond 2 cases in which tumors developed following trauma. In 1 an epithelioma appeared 2 months after a prick of the lip; the other was a patient of 80 who had sarcoma of the breast following a trauma which was treated by a physician and hence well authenticated. The age of the patient and the unusual site of the tumor argue in favor of trauma.—*Semaine Medicale.*

Notices and Reviews.

"Surgery: Its Principles and Practice." In five volumes. By 66 eminent surgeons. Edited by W. W. Keen, M. D., LL. D., Hon. F. R. C. S., Eng. and Edin., Emeritus Professor of the Principles of Surgery and of Clinical Surgery, Jefferson Medical College, Philadelphia. Volume III. Octavo, 1,132 pages, with 562 text-illustrations and 10 colored plates. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co., 1908. Per volume: Cloth $7.00 net; half morocco $8.00 net.

The third volume of Keen's Surgery is arranged as regional surgery in its anatomic sense. It contains 17 chapters, each devoted to one region of the body. The scope of the volume includes the head, neck, thorax, and some of the abdominal viscera.

Among the contributors will be noticed the names of several eminent foreign surgeons; Gottstein on the Esophagus, Kocher on the Thyroid Gland, Moynihan on the Pancreas and on the Spleen, Owen on the Mouth, Teeth and Jaws, and Robson on the Stomach. The names of these authors is sufficient guarantee of the excellence of the various chapters contributed by them.

Among the American contributors are two members of the American Association of Railway Surgeons, Dr. E. Wyllys Andrews, who contributes the chapter on the Surgery of the Neck, and Dr. Charles H. Mayo, who—in association with Dr. William J. Mayo—treats of Surgery of the Liver, Gall-Bladder and Biliary Ducts.

In addition to these we see the names of Brewer, Finney, Da Costa, Munro, Harvey Cushing and Harmon Smith.

With such an array of surgical talent any special mention of the work of the various contributors seems superfluous. A perusal of the volume fulfills the expectations aroused. Each chapter is a masterpiece.

The chapter on Surgery of the Head is the longest, occupying 260 pages, and in it Cushing gives an excellent exposition of the present status of the surgery of that region.

In the chapter on Surgery of the Neck, Andrews gives the best description of the radical operation for tuberculous glands of the neck which has appeared in any text-book.

The chapter on the Surgery of the Liver, Gall-Bladder and Biliary Ducts gives us the benefit of the ripe experience of the Mayo brothers in this field.

The work throughout shows careful editing. The descriptions are lucid and the illustrations good. S. C. P.

AMERICAN EDITION OF NOTHNAGEL'S PRACTICE.

Diseases of the Intestines and Peritoneum. By Dr. Hermann Nothnagel of Vienna. Edited, with additions, by H. D. Rolleston, M. D., F. R. C. P., Physician to St. George's Hospital, London, England. Second edition. Octavo, 1,059 pages, illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co., 1907. Cloth $5.00 net; half morocco $6.00 net.

The appearance of the second edition of this work, three years after the first, is an indication of the value placed upon it by American readers. A careful perusal of the book justifies the reception accorded it.

Since the first edition appeared the eminent author has passed away. This volume is certainly a worthy testimonial to his ability, and scientific research. Like most works of German authorship, the pathology and histology of the subjects treated are entered into very fully and thoroughly. The editor, Dr. Rolleston, has added considerable material to the original text, thereby bringing it up to date. He also gives the opinion of others, derived from experience gained since the first edition, and is certainly to be commended for his part of the work. On medico-surgical subjects there is a leaning to ultraconservatism, which will not be concurred in by the great majority of American readers.

Under the head of Acute Circumscribed Peritonitis, Appendicitis is discussed. In determining when we should operate, the author takes the position that internal treatment is indicated and successful in a certain number of cases, that they should first receive medical treatment, with operation later if necessary. This view we believe to be both dangerous and fallacious, and is to be deprecated, and in fact the entire article on the treatment of appendicitis is contrary to the present accepted view. The notes of the editor, however, freely interspersed, are in direct opposition to these statements, and will minimize the danger should these statements remain unchallenged. As a work for the internist on diseases of the intestines and peritoneum, it is undoubtedly complete and thoroughly up-to-date. J. R. H.

The Principles and Practice of Modern Otology. By John F. Barnhill, M. D., Professor of Otology, Laryngology, and Rhinology, Indiana University School of Medicine; and Ernest de W. Wales, B. S., M. D., Associate Professor of Otology, Laryngology and Rhinology, Indiana University School of Medicine. Octavo, 575 pages, with over 300 illustrations, a few being full-page, many original and several in colors. Cloth $5.50. Philadelphia: W. B. Saunders Co.; Chicago: W. T. Keener, Son & Co., 1907.

Beginning with the first glance at this book the observer is favorably impressed by the number and clearness of the illustrations and the high grade of typographic work employed in its make up.

Further investigation corroborates the correctness of the first impression. While not nearly so exhaustive as either Politzer or Dench, a sufficient description is given, so the reader will be fully advised as regards the diagnosis and treatment of the various pathologic manifestations to which the ear is subject. Tabulated points of diagnosis are given in case of different diseased conditions in which errors in discrimination might be made.

The value of the book as a practical guide is greatly enhanced by lucid description of the little details of technic in treatment. Much attention is given to prophylaxis and to the desirability of early attention whenever the ear is at fault.

Due credit is given to the importance of the pathologic naso-pharynx in the causation of ear troubles, though the equally important relationship of mal-conditions of the faucial tonsils and nose is practically overlooked.

Edwin Pynchon.

"A Manual of Orthopedic Surgery," by Augustus Thorndike, M. D., Assistant in Orthopedics Harvard Medical School, etc. With 191 illustrations. Philadelphia: P. Blakiston's Son & Co., 1907. 12 mo. Flexible leather, 401 pages. Price, $2.50 net.

This is a very excellent work for the student and busy practitioner. The grouping of subjects makes it especially valuable for a student, and at the same time it is sufficiently comprehensive for the general practitioner.

The articles upon "Scoliosis," and upon "Deformities from Diseases of the Nervous and Muscular System," are especially good and up-to-date.

The book will be a valuable addition to the library of every physician. A. R. M.

"A Manual of the Practice of Medicine." By A. A. Stevens, A. M., M. D., Professor of Therapeutics and Clinical Medicine in the Woman's Medical College of Pennsylvania. Eighth Edition, Revised. 12mo, 558 pages, Illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener & Co., 1907. Flexible Leather, $2.50 net.

The value of small manuals on different branches of medicine and surgery is shown by the rapid exhaustion of successive editions of Stevens' "Practice." Two years have elapsed since the last edition appeared. The eighth edition has been thoroughly revised, new material added, and most of the section devoted to Diseases of the Nervous System rewritten.

AN AID IN ELICITING THE PATELLAR REFLEX.

There are some persons who do not seem capable of obeying the injunction to let their muscles "go loose" during a physical examination. To avoid the difficulty in an attempt to elicit the patellar reflex, W. Guttmann advises suspending the limb by means of two towels, one above the knee and the other below it, the upper towel so arranged as to make slight traction toward the trunk.—*New York Medical Journal.*

A CANCER EXHIBITION IN BRUSSELS.

In September, 1908, a cancer exhibition is to be held in Brussels in connection with the Second International Surgical Congress. The exposition is to comprise exhibits of all sorts relative to the nature, occurrence, investigation and treatment of malignant new growths, and will be under the direction of the general secretary of the Surgical Congress, Professor Depage of Brussels.—*Medical Record.*

That the *bladder* may be protruded from the abdomen is coming to be recognized as not very rare; in fact, it is probably to be found associated with nearly 1 per cent of inguinal herniæ.—*Eccles.*

Personal

Dr. A. L. Blesh of Guthrie has removed to Oklahoma City.

Dr. D. S. Fairchild, Jr., of Clinton, Iowa, has been elected secretary-treasurer of the Iowa Society of Clinical Surgery

Dr. J. G. Hayden, formerly associated with Dr. A. I. Bouffleur in Chicago, has been appointed local surgeon for the C. B. & Q. in Kansas City.

Dr. J. P. Aylen, formerly of Sheldon, N. D., has been appointed chief surgeon of the Northern Pacific hospital at Missoula, Mont., vice Dr. E. W. Spottswood, resigned.

Dr. James G. Hunt of Utica, N. Y., has been reappointed surgeon for the New York, Ontario & Western Railway Company. This is the commencement of Dr. Hunt's twenty-fourth year in the service. The first two years he was employed by the Delaware & Hudson Canal Company, and when the New York, Ontario & Western Railway Company took possession he was reappointed as the surgeon for that company and has served the balance of the time, making in all twenty-four years in the service of the company at the expiration of 1908.

GUN SHOT WOUNDS OF BLOOD VESSELS.

From observations at Harbin, Brentano condemns too early intervention; especially in cases of extensive hematomata, in such the dangers of infection are great. Subsequent suture of vessels is rarely possible. Such suture could be made only circular; on account of the extent of the defect could never be linear. Suture would be difficult on account of the serious infiltration of the walls of the vessels, and their reduced elasticity, resulting from processes of absorption of the blood exudate. Of the 7 operated cases, 4 were tangent wounds and 3 perforating. The first 4 included 3 of the brachial artery and 1 of the radial. The other 3 were of the external iliac, femoral and anterior tibial; the continuity of the vessel being still preserved in all of these.- *Military Surgeon.*

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PUBLISHER'S DEPARTMENT

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The spectrum of some lamps being sold for therapeutic uses, shows a preponderance of the lower or red end—heat rays, the light and chemical frequencies being of such a low order as to have no clinical value. This applies to all lamps made with globes under 200 candle power. To increase the number of globes does not change the spectrum, although the candle power is increased. The spectrum will still remain that which the amperage passed through each filament will generate. It is not candle power alone that is wanted in light therapy. The *quality* of light employed is, however, of greatest importance. *Increased amperage,* alone, will increase the proportions of the spectrum that are light energy and chemical energy.

The reflecting surface does not affect the quality or proportions of the different frequencies of the spectrum. It simply projects the rays in the direction wanted. One that brings the rays to a focus is bad, for concentration in light and heat energy is destructive to normal tissue cells—diffusion is constructive. The constant effort has been to secure the greatest possible diffusion which is accomplished by causing the rays to be thrown broadly out of parallel.

The Leucodescent with a single 500 candle power globe utilizes 12 amperes of current and generates radiant heat energy, light energy and chemical energy of a very high order—three distinct physical modalities of great value in therapeutics, each one producing different physiological changes. That's the reason why you should select and use a 500 candle-power "F Special" Leucodescent.

Send for clinical reports and reprints to the makers, Spear-Marshall Company, 1252 Republic Building, Chicago.

KNIVES.

There are knives *and* knives. A poor knife is worse than none at all. The surgeon who is tempted by an offer of cheapness in a knife acts unwisely. When the cheap knife proves worthless (as is almost invariably the case) he forgets that it did not cost him much money and he realizes only that the article is of no value. On the other hand, even though he may have paid a little more for a really good knife, he forgets that also, in the realization of the fact that the article is good. The celebrated "Little Razor" brand of knives, manufactured by Huston Brothers Company, 35 Randolph street, Chicago, are good. The "Little Razors" are a splendid instrument for the surgeon. Huston Brothers Company are willing to risk their reputation on the high quality of these "Little Razors" (so called because made of the finest quality of razor steel). Should you buy

one of these knives from this firm and find it unsatisfactory, you may return it and get your money back. Every surgeon whose stock of knives is not complete ought to send to Huston Brothers Company at least a trial order. Their advertisement appears in this issue.

Time was when surgeons worked unaided by any mechanical device. Time is when there is nothing lacking in apparatus for their use in point of electric and mechanic construction. With these wonderful apparatuses and equipment the work of the surgeon is not only immeasurably lessened, but reduced to a long degree of scientific exactness of inestimable value. In view of the great number of damage claims that have been filed against the railway companies during the past several years, no railway surgeon can consider himself equipped to properly defend the road's interests in the many false claims unless he has a skiagraph of the injury. What better and more conclusive evidence could be so plausibly presented to the attorneys in the case than this! There is no denying nor getting around it. Fine oratorical efforts are lost in the face of a fact. "Forewarned is forearmed," says the proverb, so surgeons would do well to investigate into the very best and latest forms of apparatus which are now being placed upon the market, manufactured by the oldest and most reliable people in this line.

If any of the readers of the journal is unsatisfactorily or insufficiently equipped and wishes to produce accurate X-ray diagnoses, it would be well to post himself at once on the latest X-ray instrument and electro-therapeutical apparatus.

The C. F. Birtman Company, 152 East Lake street, Chicago, Ill., have been engaged for many years in the manufacture of this kind of apparatus and can give much desired information in this connection.

A portable X-ray apparatus is the newest appliance for the surgeon. The Chicago X-ray Coil Company are just introducing a portable X-ray coil and high frequency apparatus, with cautery and ozonator attachments, for which the claim is made that it will do as good X-ray work as many of the larger and more expensive instruments. Alternating or direct current can be used and perfect radiographs obtained. Surgeons generally will find the Chicago portable X-ray outfit of excellent service in many cases.

CHANGE OF SCENE AND PROPER MEDICATION.

During the past two months we have met with more la grippe than anything else, and the number of cases in which the pulmonary and bronchial organs have been very slightly or not at all involved, has been greater than we have noted in former invasions. On the contrary, grippal neuralgia, rheumatism and hepatitis have been of far greater frequency, while the nervous system has also been most seriously depressed.

With each succeeding visitation of this trouble we have found it more and more necessary to watch out for the disease in disguise, and to treat these abnormal manifestations; consequently we have relied upon mild nerve sedatives, anodynes and tonics rather than upon any specific line of treatment. Most cases will improve by being made to rest in bed and encouraging skin and kidney action, with possibly minute doses of blue pill or calomel. We have found much benefit from the use of antikamnia and salol tablets, two every three hours in the stage of pyrexia and muscular painfulness, and later on, when there was fever and bronchial cough and expectoration, from an antikamnia and codein tablet every three hours. Throughout the attack and after its intensity is over the patient will require nerve and vascular tonics and reconstructives for some time. In addition to these therapeutic agents, the mental condition plays an important part, and the practitioner must not lose sight of its value. Cheerful company, change of scene and pleasant occupation are all not only helpful, but actually necessary in curing the patient.

A NEW METHOD OF TESTING THE FUNCTIONS OF THE DIGESTIVE APPARATUS.

Einhorn (*Therapeutic Gazette,* January, 1908) submits a method for investigating the functions of the intestinal tract, the principle of which is the administration of test substances with the food and observation of the effects of the digestive fluids upon these substances.

Practically this test is made as follows: Patients are given in a gelatin capsule a string of beads with the following substances attached thereto; catgut, fish-bone, meat, thymus, potato, mutton fat. After administering the capsule, every stool is examined with the stool-sieve until the bead-string has been recovered. If diarrhea is present the sifting may not be necessary, as the bead-string can readily be seen (usually at the bottom of a glass vessel).

Under normal conditions the bead-string appears after one or two days. It is then rinsed in cold water and examined. If digestion is normal we find that catgut, meat, and potato (except the skin) disappear entirely, thymus and fat almost entirely, whereas the fish-bone usually disappears, but occasionally it may be present. The nuclei of the thymus always disappear. In pathologic conditions deviations from the normal are observed, not only in regard to the time of recovery of the beads (disturbances of motility), but also in regard to the presence of the food substances (disturbances of the digestive function).

The author divides his cases of intestinal digestive disturbances into two groups:

1. Those of pure nervous intestinal dyspepsia. 2. Those of genuine intestinal dyspepsia.

In that great class of cases of intestinal dyspepsia, in which the starch digestion alone is disturbed, Taka-Diastase (Takamine) has proved of especial value.

In a discussion of puerperal septicemia (*Amer. Jrl. Obstet.*, June, 1906), Prof. George T. Harrison said: If one does not use collargol in these severe forms of infection, one has not done his duty. I have saved cases with it that I could not have cured in any other way. When intravenous injection can not be employed, collargol should be given by inunction or per rectum.

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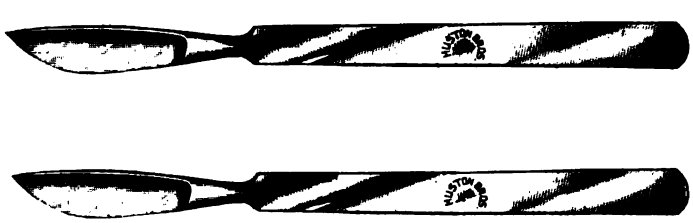

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The Railway Surgical Journal

Vol. XIV—No. 8 CHICAGO, APRIL, 1908 Whole Number 263

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THE Railway Surgical JOURNAL

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TREATMENT OF BURNS AT MINNEQUA HOSPITAL, PUEBLO, COLO.*

The purpose of this paper is to state as briefly as possible some observations on the local treatment of burns.

There is no better classification of burns than the time-honored one of the old surgeons into those of the first, second and third degrees: First causing erythema only, second the loss of epidermis only, and third necrosis of deeper tissues.

It has been our practice to treat burns of the first and second degrees with the open air and air blast methods just as early as possible and to carry the cases through on these plans, except that in burns of the second degree it has sometimes been found necessary to apply a softening dressing for a few hours at a time at intervals of a few days during the course of the more refractory burns of this type.

Even in burns of the first degree, during the first twenty-four hours the patient occasionally will require to have the burned surface covered with a bland ointment. For this we use:

℞	Zinci oxidi	℥iii
	Olei olivæ	℥iii
	Petrolati	℥xvi

M. et ft. Ung.

Sometimes adding to each ounce of this ointment Pulv. opii gr. xx, should the severe pain demand such measure. This is rare, however.

The surface is left entirely open to the air as soon as possible, and as much as possible in burns, both of the first and second degrees.

In most cases we have used the air blast. The blast of warmed air being thrown against the burned surface constantly by an electric fan or by means of a bellows which may be

PATIENT TREATING BURN WITH AIR BLAST.

pumped or worked by the patient himself during the waking hours. Burns of these classes (*i. e.* first and second degree burns) usually do much better under this treatment than when treated by means of any of the methods which keep the burned and exfoliating surface constantly soft by means of oleaginous and macerating applications.

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907

Burns of whatever degree are *always cleaned dry,* that is to say the detritus whether of foreign matter, epidermis, or necrosing deeper tissues, is *always removed* by dry sponging or with the tissue forceps, and no water nor solutions are used to irrigate the burned surface.

In burns of the third degree (and sometimes for a few hours at a time in second degree burns) the dressing of zinc oxid ointment is applied and changed daily. The same being removed dry, the wound thoroughly cleaned by dry sponging, scissors and forceps, and the ointment spread thickly upon lint or gauze reapplied.

We have not been able to use the open air or air blast treatment with satisfaction in burns of the third degree.

When blebs are formed in second degree burns their contents should always be liberated as soon as possible and the fresh under-surface exposed to the action of the air.†

†See Dr. H. Sneve's method of treating burns.

FRACTURES OF THE PATELLA.*

O. FORDYCE, M. D., GUTHRIE CENTRE, IOWA.

Fractures of the patella are said to represent about 2 per cent of all fractures that occur.

This is always a serious fracture, one in which from the position, function and peculiarity of the bone—a sesamoid bone—there is a great liability of its leaving behind it a legacy in the form of permanent disability, no matter what treatment has or has not been pursued in the case and leaving in its wake a case to settle for if the recipient of the injury happens to be in the employ of a corporation.

The position of the bone unduly exposes it to trauma and once fractured predisposes it to refracture—this is possibly due to its being only partially covered with periosteum, and possibly is a factor in the absence of bony union which so frequently occurs. Its function—that of a pulley—makes this loss very apparent in the lack of power of extension of the leg, accompanied as it often is by lack of muscular power in the extensor muscles themselves, or occasionally adhesions of the upper fragment to the femur. The surroundings of the bone render it especially liable to hindrances to bony union in the way of interposition of periosteum, fascia or aponeurosis between the fragments and the traction of the extensors makes approximation and retention difficult—presenting an anomaly in this respect in the treatment of fractures. In other fractures muscular contraction causing an overriding of the fragments.

In looking over the literature of this subject one is impressed by the variety of views expressed as to operative or non-operative treatment being the only treatment which could be successfully defended by the surgeon. It reminds one of a theological discussion and it seems to the writer that the diverse claims are about nearly possible of demonstration as that of the difference of theological tenets. Neither he who operates on every case nor none is right.

The compound cases would be just as well sutured and in the cases resulting from muscular contraction there is usually a transverse fracture with laceration of the aponeurosis. These, I think, are usually best treated by operation and especial attention should be given to the suturing of the aponeurosis as this of itself will partially retain the fragments in approximation and reinforces wiring should this be done. It is questionable if suturing of the aponeurosis is not really the most important.

I will briefly give you my personal experience and express my convictions on the subject: (By the way I have but little use for a man who has practiced his profession long and has no convictions.)

My own observation is limited to 5 cases occurring in 22 years' practice. In none of these were the results "too bad," as they say across the border in Canada. Two were treated by the non-operative method—extension of the leg—posterior splint and strapping of the fragments, and the results were fairly good; none bad. Three were operated, the third and last was a case in which a comparison of results from operative and non-operative treatment may be made as he had one old fracture of the patella treated by the usual non-operative method, by

*Read at fourth annual meeting American Association of Railway Surgeons, Chicago, October 16, 17, 18, 1907.

whom or the details of which, I cannot give.

The old fracture was a very disabling one, his occupation that of a tinner and the man could ill afford to lose very much time. In this case there was separation of the fragments of over an inch and tilting of the lower fragment so the articular surface presented toward the upper one, interposition of facia and periosteum between the fragments and a torn aponeurosis. The patient was kept in bed, a posterior splint applied and the parts approximated as nearly as possible with Z O-plaster. On the sixth day it was operated by a curved incision, clots removed, bone drilled and wired with wire which

was evidently of poor quality. The aponeurosis was sutured with 30-day catgut. In about a month he was walking with an apparatus of his own devising strapped to the back of his leg. After this the muscles were daily massaged by himself or his wife. I present skiagrams of the two patellæ for your inspection and regret that I can not show better results in the operated case but so far as function is concerned there is everything to be said in favor of the operated case. I met him on the street a day or two ago, and he described in very glowing terms the superiority of the last leg as he called it; he also stated that there was very marked improvement in the other leg owing to increased use of it during the time that he walked with the brace on the back of his leg.

Case 2.—R. W., age about 26, engineer, operating a traction engine for a threshing machine outfit, attempted to turn his engine off a dead center by turning the fly wheel. The result, some other bruises and a compound comminuted fracture of the patella at its lower end. A physician residing near by treated his wounds and sent for me for the express purpose of operating. This was in a farm house; and

while the preparation was very good for aseptic work, I felt it was not the time and that in my repair shop, I could find better environment. I simply and absolutely refused to operate, but in a week had him brought to the hospital. He arrived in very good condition. Bichlorid dressings had been constantly applied, and fortunately there was no infection. There had been a good job of cleaning up done prior to my seeing him. The joint was freely laid open, clots removed and great care exercised not to finger needlessly around in the joint. About

the lower fourth of the bone was badly comminuted. Some small pieces, entirely void of attachment were removed, a strong silkworm gut suture was passed in a figure-of-8 through the broken bone and ligamentum patellæ, each end being passed through a drilled hole in the larger fragment and tied securely above. The fascial rents united with catgut. The results were as good as could be desired. I saw the man a few months ago but was unable to get a photograph. He exhibited the leg showing a good degree of flexion and extension, and there was practically no limp in walking.

Case 3 was a man of 32—cause muscular contraction. There was a rather wide separation of the fragments (¾ inch) and a good deal of effusion in the joint. After 7 or 8 days' observation he concluded to have it operated. Nothing unusual about this—fragments were drilled and wired and the result good. He passed from my observation soon after, so I do not know his present condition.

In two of these cases I certainly have reason to think the results obtained by suturing were better than could have been obtained otherwise. In the comminuted case, all that could be hoped for was obtained.

In thecase in which a skiagram is shown there was a marked tilting of the lower fragment so the articular surface presented—and periosteum and fascia were interposed between the broken pieces—certainly not an inviting prospect for bony union—this did not occur as you can see, but the fragments are "hooked up" very well, and it is only fair to presume that the results would have been worse had not these factors been eliminated by operation. This was done under cocain infiltration owing to the fact that he had had fully his share of the beverages that cheer and inebriate. In this case he elected the operative treatment, after having both sides of the question fairly stated to him. With the other leg badly lamed he wanted the best result obtainable in this one and could illy afford to lose the time for prolonged treatment.

Within the last year I have had 4 cases of fracture in other bones which have required open treatment and have seen others that would have been better operated. The writer has invaded the knee joint quite a few times and so far has escaped infection. This experience has convinced him that he is hardly doing his duty by the patient, if he refuses operation in these cases, when it is indicated.

The pathology is frequently that of extensive tears of the aponeurosis, plus the fracture, and the former must be carefully repaired. This is regarded by many of much experience as being in those cases the most essential thing to be done, and in fact all that it is necessary to do. The cases from direct violence in which there is a compound fracture, would just as well or better be operated. Those in which muscular action is the cause usually have also aponeurotic tears, and if the separation of the fragments is ½ inch or more would better be so treated. Given, of course, a subject of proper age and fit for operation.

The one danger, that of infection, should be fairly stated to the patient—and you can not assure him of bony union if operation is resorted to—better function is a better question to discuss with him. No other course is defensible or excusable—for should infection occur the result may be simply disastrous. These are the cases in which above all cases if the expression is permissible—in which strict precaution should be used—gloves, and knife-and-fork methods adopted so far as possible and no unnecessary meddling be indulged in. The time for operation is important—there is no hurry in these cases—wait a few days until nature has removed the handicap resulting from the trauma and then you can have at least fair fight against infection. Do not operate anywhere that suits the patient's convenience. Secure the best environments and safeguards against infection, or let them alone so far as operative treatment is concerned.

I can not refrain in this connection from quoting from an article by Mr. Carleton P. Flint,* who made a very exhaustive study of infection of the knee joint, based upon a study of 310 cases:

"One out of every 22 operations on clean knees becomes sufficiently infected to demand operation. 4.6 per cent.

"One out of every 9 operations for recent (5 days) traumatic non-penetrating injury be-

*Annals of Surgery, October, 1905.

comes sufficiently infected to demand operation. 11 per cent.

"One out of every 22 operations for simple fracture of the patella becomes sufficiently infected to demand operation. 4.6 per cent.

"One out of every 71 operations done for fracture of the patella done after the 5th day becomes sufficiently infected to demand operation. 1.2 per cent.

"One out of every 9 to 10 operations for fracture of the patella done before the 5th day becomes sufficiently infected to demand operation. 10.5 per cent.

"Of compound fractures of the patella 7 out of 9 become sufficiently infected to demand operation. 78 per cent.

"One out of every 9 infected knees which have been operated and drained dies. 11 per cent. Some after previous amputation.

"One out of every 15 infected knees, which have been opened and drained comes to amputation before recovery. 6.6 per cent."

These statistics were gathered by Mr. Flint, from the work of the New York surgeons during the last 10 years taken as they come in the records, and probably more nearly represent the actual state of affairs than would a similar collection of cases taken from the literature.

DISCUSSION.

Dr. G. W. Green, Chicago: Every fracture of the patella where there is any separation to speak of should, I believe, be operated on, and at once. I see no reason why 5 or 6 days should go by before an operation is instituted, any more than that 4 or 5 days should go by before a fractured femur is set, and I fully agree with the essayist that they all ought to be done in a good hospital. It seems to me that infection should not follow operation upon the patella any more than it would follow an abdominal operation, and in a hospital we do not have an abdominal wound become infected.

Dr. I. K. Gardner, New Hampton, Iowa: I wish to say a word with reference to the frequency of these fractures. In another society a few years ago a gentleman made a statement in his paper something like this: "Having seen a large number of cases of fractured patella during the last year, I feel warranted in presenting this paper." I combated the view that these cases are so frequent, and the discussion brought out the fact that the cases were not frequent, the percentage was small. I had been in practice then 25 years and I had had only 2 cases. We found men who had had a large general practice for 25 or 30 years who could not report any cases. So we thought we had that man downed in that respect, and the statistics today bear out this view; it is a fracture not of frequent occurrence.

Dr. W. Van Werden, Des Moines, Iowa: I wish to compliment the writer of this paper, for it is a very good one. I believe there is no question in the minds of the majority of surgeons that there should be no reluctancy as to operating upon a fractured patella. One certainly feels more secure by uniting a fracture firmly. While kangaroo tendon is certainly good, I am confident that wire will produce better results, there is absolutely no giving, the parts will not separate as they will when united with suture material. In one operation in which I used kangaroo tendon, before I had had experience in wiring, the parts were not in close apposition, although the results were perfect; but there was no reason why I could not have had the fragments firmly united. The union was all right, but the separation was probably about the thickness of a dollar, and there was no way of determining that only by the x-ray. And if one is careful to bury the ends so that they will not be a source of irritation, the wire can stay there for years. However, if at any time one using wire wishes to remove it, it is a very easy matter.

Dr. F. T. Fort, Louisville, Ky.: Dr. Green advises immediate operation for fractured patella. In 13 years' experience I have seen 3 cases and I have known of several others, and my idea is that if there is very much edema, and especially if you have much trauma, a stellate fracture, it is much better to put a short posterior splint on and an Esmarch bandage and leave that on some days and then you can make longitudinal incision and with retractors sever over the fractured patella. If you have a stellate fracture, of course you have to put in suture. I think kangaroo tendon is really the best. But in Switzerland I saw a surgeon operate on a fractured patella of two weeks' standing, with a large blood clot, and he used a large silk ligature twisted above the upper fragment and brought below the lower.

The experience of a great many American surgeons relative to wiring has not shown the best results. In some cases the wires have been known to give way, while if you can bring your fragments together with kangaroo tendon and keep them in apposition for 6 weeks to 3 months (it is supposed to last from 2 to 3 months) you get good results. That is as long as you care for the fragments to be held in position, for in the meantime the callus will be thrown out and you will have good apposition.

Dr. A. B. Brumbaugh, Huntingdon, Pa.: Most of the surgeons who talk on these subjects are younger men than myself. I was taught surgery before 1866, when sepsis and antisepsis were not taught, and long before suturing of tendons was thought of. I was among wounded men considerably during the Civil war, and I had several cases of fractured patella. I constructed a splint which kept the leg extended, then I would make a pad fitted exactly to the upper fragment of the patella, bind it on the thigh, then with a figure-of-eight bandage bring the lower fragment up and hold it in position, and I never had separation of the fragments when I had a case under my care with that treatment. I never had a case where the fragments separated, and I never wired a case. In my recent cases I treat them still in the same way, and I get good results without wiring.

Dr. A. R. Mitchell, Lincoln, Neb.: I simply want to ask a question: What method is used by Dr. Fordyce in treatment of the case after operation?

Dr. Fordyce (closing): As to the treatment after operation, treat them absolutely as little as possible.

Dr. Green spoke of the absence of infection following operations upon the abdominal cavity. It seems to me that perhaps a knee-joint is at a disadvantage as compared with the peritoneal cavity, having less ability to resist infection. It has no omentum down in there.

I am very glad to hear that the gentlemen on the floor have had several cases. I will state this in explanation of the number I have had: Three out of five were due to the courtesy of my neighbors, and also to the fact that out in my country I am the man to be jumped on if anything goes wrong.

TREATMENT OF FRACTURED PATELLA.*

L. SEXTON, M. D., NEW ORLEANS, LA.

Out of 38,627 fractures, 660 were fractures of the patella 13th in frequency, or 1.90 per cent (Keen), Von Bergmann gives the percentage as 1.40 per cent.

Three-fourths of the fractures of the patella are dependent upon direct violence and muscular contraction, thus producing what is known as the "fall" or "blow fracture." Owing to its large muscular attachment and the cancellous composition of the bone it is very rarely broken by direct violence alone. Fracture by direct violence may rend the bone in any direction, in fact may comminute its structure. When the ligaments and aponeuroses are not broken the displacement may not amount to much, even when the trauma to the joint is very great. Fractures due to muscular force and direct violence (80 per cent) are usually transverse, with the separation in the bone very marked. The usual line of cleavage is through the lower third of the patella, leaving the upper two-thirds drawn up by the rectus and vasti muscles.

Symptoms need hardly be referred to, except to state that usually the joint is distended, there is inability to extend the leg, pain upon motion, and a distinct separation of the ends of the bone when the fracture is transverse, this separation can both be felt and seen. Crepitation may often be obtained provided the two bones can be approximated.

To be brief, the treatment of these cases may be undertaken: (1) by the subcutaneous stitch method, (2) appliances of splints and bandages, (3) and the open or operative treatment method. The old method of brad awl, and wiring the fragments together, the staples, wire suturing were usually put in by one operator, to be removed by another at some subsequent development of trouble, thus misleading the original operator in the subsequent complications of the case.

Before our present perfect system of aseptic

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operating many of the results of opening the knee joints were disastrous in their consequences. I remember once when one of our oldest surgeons in the Charity Hospital, New Orleans, was removing a loose cartilage from the knee joint, said, "Gentlemen, if I get out of this joint without serious trouble, I will never open another voluntarily." But we must remember that was 25 years ago, and we have long since then been doing operations with impunity that were not even suggested at that time. I do not mean by this that the knee joint is not a sacred precinct surgically, for it would be positively criminal for any one not experienced in the aseptic management of these cases to open the joint, unless prepared to carry on the operation and after-treatment with the greatest aseptic precautions. As a matter of course, in cases of longitudinal, stellate, or fractures from direct violence when the fragments are not separated, open operative treatment is not to be thought of, but the other retentive methods are entirely suitable for all such cases.

If the patient can extend the leg it is an indication it is a "blow" and not a "tear" fracture, and I would suggest a splint treatment. By any method of treatment, absolute fixation of the leg by splint or plaster-of-paris is essential, the suspension of the limb in a swing also allows much more freedom of motion with no risk or strain upon the ligatures. If permanent ankylosis is the best result to be expected, this fixation might be in the partially flexed position, but if, by extension, we get a firm union of the bone which is most likely we can take care of the temporary stiffness by subsequent massage, hot applications and passive motion. A stiff joint for a while is to be expected, it matters not what treatment is followed on account of the inflammatory and peri-articular contraction that takes place in the joint and its long confinement in splints. A general anesthetic is occasionally necessary to break up these adhesions.

Fixation splints can be resorted to, taking cloth and saturating several thicknesses of cloth in plaster, will answer. Splint should be long enough to extend from tendo Achillis to the gluteal folds and wide enough to encompass two-thirds of the limb.

In non-operative cases if there is a violent retraction of the upper fragment it can be held down by Z. O. plaster, just above the patella and reaching around (the leg previously having been shaved) to the popliteal space. A light figure-of-8 bandage around the leg is another method worth adopting in non-operative cases, in addition to the posterior splint.

The absorption of the adipose tissues and abatement of swelling renders it necessary to tighten the bandage quite often, in fact, after a week's treatments by the above method, the plaster-of-paris dressing may be adopted, or the original bandage tightened.

The question as to when the patient shall cease to use this splint depends largely upon the repair that has taken place in the fracture. From three to six weeks will usually be required in getting a perfect result in the quick and slow cases.

After firm union has taken place the posterior splint should be removed daily and hot applications applied around the joint, massage and passive motion in order to bring about a perfect result (functioning) to the joint. In cases of fibrous union and wide separation with inability to extend the limb, we are sometimes justified in opening the joint, removing the fibrous tissues and suturing the fragments together; as a matter of course this only applies to those whose experience and surroundings can make the operation extremely aseptic. It has occurred to me that when this ligamentous union practically permits of good use of the joint, that the Bier method of elastic bands around the joint above the knee much as a tight garter is worn, might result either in the development of osteoblasts or the absorption of these ligamentous bands, which might in some instances reduce the joint stiffness. Attempts at walking usually at the end of the third or fourth week after operating, and at the end of 6 weeks patients should be encouraged to go up and down stairs, or take any other exercise necessary toward loosening up the joint ligaments.

The open method, or operative treatment in all compound and other cases is justifiable from the following facts:

(1) No other method of treatment can approximate the fractured ends of bones, and get rid of the interposing soft tissues at the same time, as easy as the open method of treatment. method of treatment.

(2) The open method is the seeing method. We are not guessing, we actually know the existing conditions and the approximation of the parts.

(3) No other method allows an opportunity to get rid of small detached portions of bone, which from loss of periosteum become foreign bodies in the joint cavity.

(4) No other way permits the repair of the torn lateral ligaments which is so essential in joint repair.

Again, it lessens the time of confinement and treatment by nearly one-half, in addition to giving a much better anatomic and functional result, where adhesions and septic complications do not follow. The suture material should be no larger in size or quantity than is absolutely necessary for the approximation of the parts. Any 10 to 20 day absorbable material, strong but not too bulky, will answer for sutures, very small kangaroo tendon, or catgut ligature will do. The idea is not to introduce too much foreign material into the joint as there is no advantage to be gained by too large or thickly applied sutures.

If it is a case requiring operation, there is nothing to be gained by waiting, but never under any circumstances be forced into opening the joint except under the most aseptic precautions. The less manipulations of the parts the better the results. The tissue should only be handled with instruments and gloves, no fingering, or more irrigating than is absolutely necessary to wash out blood clots and other foreign material. There is necessarily some trauma produced by trimming off the crushed tissue, and peripatellar capsule that usually falls over apron-fashion on the upper fragment of the bone. Any clots or foreign particles which may have been forced into the joint can often be removed by sterile saline irrigation. A lifting out of the interposed torn capsular ligament which is the most fruitful source of ligamentous union is perhaps one of the best arguments for the open method of treatment for such fractures.

Remember, it's just as important to success to suture the lateral ligaments which form part of the muscular attachment to the thigh as it is to suture the periosteum. The strain on the front ligatures are also lessened by these wide sutures. Mattress sutures are perhaps the best for the anterior sutures as they encompass more tissue, approximate the fragments better, and are less likely to tear out.

The amount of separation between fragments is 1½ to 3 inches, usually dependent upon the extent of the laceration of the capsular ligament.

One of the arguments for operation is that these broken fragments are quite often tilted so the fracture ends—even though no soft parts intervene—can not be brought together by the ordinary retentive appliances.

The torn prepatellar tissue is quite often turned in apron-like over the broken fragments rendering anything but ligamentous union practically impossible, in fact, the patella is a sesamoid bone in which the beginning of the osteoblasts takes place not earlier than the third year and is rarely completed before puberty showing the natural tendency is toward fibrous instead of bony union. This fibrous union is usually ½ inch in length and when firm, the junction of the limb is not materially impaired. Stretching and even complete rupturing of this band is not uncommon after accidents.

As a matter of course the open treatment is always indicated in compound fractures of the patella. The open method of treatment is adaptable to cases in which no general anesthetic could be admissible. The operation is not very painful and can be easily accomplished by a hypodermic of ¼ grain morphin followed by cocain infiltration.

Case.—Miss S—, æt about 25, while descending the stairs, thinking she was at the last step, missed her footing, falling with great force upon the patella, fracturing it transversely across the lower third. She could not

walk upon the limb but was assisted to bed. I found the knee joint distended and the fragments separated with violent contusion and bruising over the patella. It being at night, I put on a posterior splint with a figure-of-8 bandage around the knee to hold the fragments in place until she could be moved to the Infirmary next day where the knee was prepared for operating just as carefully as if it had been an abdominal section. Esmarch's bandage was applied above knee, a horse-shoe incision made over the patella so as to bring the scar tissue above pressure in the kneeling posture. The incision was carried down into the joint with one sweep of the knife, when a large amount of bloody serum and synovial fluid escaped. I flushed the joint with a small amount of sterile saline solution washing out several clots and spicula of detached bone. We then trimmed off the rough edges of the joint ligaments, picked out redundant and separate pieces of fatty tissue, took 3 interrupted catgut sutures in the lateral ligament which was badly torn on either side. We then approximated the broken fragments of bone by 3 mattress sutures, using medium size catgut, including in the needle bite part of the periosteum and the ligaments so as to be sure the stitch would not tear through; as the ligatures were tied they brought the bone into apposition, just as closely as if they had been wired together, nothing but instruments and gloved hands touched the joint. There was just as little disturbance of tissue as possible.

The external wound was closed with catgut and adhesive strips, leaving plenty of space for oozing as no drains were put in. After a free padding of the joint and limb with sterile gauze a posterior gutter-splint of binder's board was applied, suspending the leg in a swing in an extended position. The swing gave her the freedom of the bed with the least motion to the injured joint. Plaster-of-paris has been used in some of the cases in New Orleans, but the liquid glass or binder's board is less cumbersome and perhaps as efficient. Pain was allayed with a few doses of codeia; the patient only had a rise of temperature to 99° once or twice during the first week. An x-ray picture of this case taken six weeks after the accident shows perfect bony union. The functional test shows the patient able to ascend and descend steps or a ladder with impunity.

The question of treating these cases by silver wiring, staples, etc., produce so much more traumatism to the joint that ankylosis and sepsis is much more likely to follow. Quick in and quick out with the minimum amount of intervention, which is accomplished by using the cat gut sutures, represents the most modern thought upon this subject.

DISEASES OF JOINTS FOLLOWING INJURIES, ESPECIALLY IN THE HIP AND KNEE.*

W. WOODBRIDGE, M. D., CENTRAL CITY, IOWA.
Local Surgeon I. C. R. R.

Nature has been very careful in safeguarding the joints which are most exposed to traumatisms, by placing strong fibrous bands about them, strong ligaments from bone to bone, with large resilient buffers between them, to take up the shock of any sudden jar, catching the force and distributing it evenly over—and through the joint, to prevent by concentration of the force, the splitting or tearing apart of the lamellæ.

In spite of this precautionary architecture of Nature, the joints are very liable to either primary or secondary disturbance from injuries.

We must consider that the joints are liable to have their integrity invaded from age, absorption of organic material, hereditary taint of rheumatism or gout, with arthritic deposits of the lime salts, and this often with little notice on the part of the patient, until some sudden jar, twist, the prick of a pin, tack, nail, thorn, or a blow, acting as an exciting cause sets up an inflammatory action which may go on to destruction. So much enters into the construction of a joint, and so many things contribute to its disability, that it be-

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comes a serious and complicated problem with which we have to deal.

The blood and lymph supply about the joints are two things of the very highest importance in dealing with them in disease. Without these having sufficient vitality to perform at least a part of their physiologic function, there can be no absorption, and in any injury of a joint, no matter how trivial, we have an exudate of lymph, serum, perhaps blood, and unless these exudates are speedily absorbed there is sure to be trouble.

Inflammation is an undue determination of blood to a part, the nutrition of which has been previously impaired, either by disease or traumatism. As soon as impairment takes place there is a hurrying to the site of an abnormal amount of blood and lymph, and the serum pouring out of the vessels, all the interspaces become infiltrated, tension is created, pain ensues, capillary stasis, perhaps torn capillaries, and the characteristic redness is seen. If sufficient integrity of the nearby vessels, both lymph and blood, has been preserved, to enable them, after reaction from the shock to resume their normal function, either in whole or in part, then absorption begins, moves on slowly until the exudate is absorbed, and repair of the injured tissues completed, and the joint resumes its normal function. If, however, there is sufficient shock to rend the lymph spaces and vessels, and the blood vessels, then we do not have absorption of the exudate moving on in its normal course, but instead we have the pitting of the doughy mass of bruised tissue, a field ripe for infection, and a mighty troublesome condition is projected onto the field.

The very serious factor we have to deal with, and the most to be feared, is infection of the injured part. We have learned that we can readily have infection of any part of the body, without communication with the outside world, from sources not dreamed of a few years ago, and when we have a case of infection of some portion of the body which is really remote from outside contact, as the broad ligament, peritoneum, and an infected joint, we may feel absolutely certain that somewhere we may, if we search carefully, find a portal of entrance for the infection; and so we need not marvel if, when we have an injured joint and absorption is very slow, or absent, we have an infection, from some simple form to a mixed destructive form, calling for the most heroic measures in its management.

Often the most serious consequences follow a mild and innocent looking injury, as a sprain. I saw a case a number of years ago in a little girl who fell from a swing. She was standing up, and when she fell lit on her feet, twisting and spraining the right ankle joint. She was carried into the house and the foot placed on a pillow. The pain was severe that night, but subsided somewhat by morning and they did not send for a physician. The foot and ankle became discolored, swollen, but in a day or so they allowed her to get around on her feet. In a few days it began to pain her again, swelled more than in the first place. I was called and the most careful examination revealed no fracture, and, of course, I was unable to say there had been no dislocation, but if there had been it was reduced. I thought I detected fluctuation, but was uncertain, so applied hot fomentations, hot water bottles and elevated the leg, hoping to start absorption, but without avail, and in a day or so told them it must be opened and drained. This was the first joint I ever opened, and it made little chills go chasing up and down my spine, but there was no alternative, so I chloroformed her, gave the inhaler to one of the women standing by, rewashed my hand, and, with everything sterilized and ready I opened the joint on both sides, when a large amount of bloody pus ran out. It was quite freely irrigated with a 1:1,000 bichlorid solution, a gauze drain pulled through by a needle-eyed probe. It was removed the next day, wound was irrigated again, and was dressed every day. The infection subsided and the wound healed quickly. I supposed of course she would have ankylosis, and put up all the bars I could by telling them she would not have much use of the joint, but I was happily mistaken, for she had good use of the ankle.

Two years afterward she was walking, or rather running, home from school one evening, slipped and sprained the left ankle. They sent

for me the next morning and I elevated the leg, put on hot applications, but it became infected and had to be opened. She married, had three children, and two years ago died of tuberculosis. I am sure the infection was tuberculous, possibly mixed infection. They had been told by a physician when she was quite small that she was "scrofulous," and we know now what that means.

In July last a little boy 5 years old was playing in the yard and climbed up a tree. He fell, and striking on his right knee run some kind of a thorn in it. He made no outcry, but pulled it out himself, then went to the house and told his mother about it. They let him play around with no attention paid to it until he cried one night with pain and they found the joint badly swollen. They brought him to me, and after a couple of days I opened it just at the lower and inner edge of the patella and about a teacupful of pus ran out. It was irrigated, his mother dressed it every day, I saw him just a few days ago, and it is a perfect joint.

An elderly lady went from our station to Cedar Rapids, and in getting off the train in the evening she slipped, lost her balance and gave her left leg a severe twist. She caught herself, felt some pain in the knee, but got in the carriage in waiting rode out home, did her usual evening work, but the knee kept paining her worse, and she suffered terribly all night with it. In the morning they sent for me. I found the leg, especially about the knee, enormously swollen, red, and paining her so it was agonizing. I gave her a full hypodermic of morphin to relieve the pain, elevated the whole leg with a swing used for broken legs, applied hot water bottles all around the knee. She became enough easier to sleep some. On the twentieth day I detected fluctuation, and the next morning she was anesthetized and the abscess opened by a free incision, just at the lower edge of the patella on both sides of the tendon. Large quantities of bluish, bloody pus came out. The wound was irrigated, drained, dressed every day. The wounds healed quickly and she made a good recovery, though there is still some stiffness in the knee joint, but she says it is improving.

A nephew of mine, who was a letter carrier in Cedar Rapids, slipped one icy morning on the sidewalk, fell, striking heavily on his right hip. He kept on with his delivery, but went to bed when he got home, and was in bed three months. Fluctuation appeared in about ten days, and the attending physician opened it. Another abscess then formed below the great trochanter; it was opened and discharged, with little tendency to heal. He got up and about, and when the weather got warm went to the office of his attendant to have it dressed for awhile, but soon stopped coming. The physician asked me to come down to examine it, with a view of resecting the head of the femur. We got him to the office, but he then informed us he was treating with Christian Science, and was told not to let his uncle, or any other physician see it, as it would counteract all their good work. The abscess has burrowed, pocketed, opened spontaneously in half a dozen places, and is still discharging, requiring daily dressing, though of 18 years' duration. He has seven inches of shortening from absorption of the head and neck of the femur, and is an awful cripple. The attending physician managed to get a specimen of pus for microscopic examination, and tubercle bacilli were found in abundance. So badly has it affected him that I suspect there is spinal caries at the lumbo-sacral region, as there is, of course, a good deal of curvature. He had a splendid medical attendance, but would never allow either he or myself to do anything for him except open the abscess.

An engineer out in the mountains for a good many years and who got up to passenger runs, came back to our community three years ago to visit his mother and rest. He said that on his runs, some of which were night runs, he nearly always stood up, for fear if he sat down the swing of the engine might make him drowsy, and he might, for the fraction of a second, lose himself. It was necessary for him to brace himself on account of the sharp curves, and the reverse curves would cause a slight twist of the hips as he was busy with his hands. He began complaining two or three years before of pain in the left hip, which was diagnosed as sciatica. It kept growing worse,

the knee began to pain, and he noticed there was some swelling about the hip, and the pain caused a loss of sleep.

I was called to see him, and suspected disease of the hip joint and told him so. The inguinal nodes were swollen and tender, but aside from the pain the knee was not sore. I put him to bed and off the leg entirely, with it elevated in the swing for broken legs, with extension. The swelling and infiltration increased, until I was satisfied there was pus, and so gave an anesthetic, opened deeply and found a lot of foul smelling pus, tinged with blood. I could feel denuded bone with the probe then. Another abscess formed lower down, I had a bacteriologic examination made, and found the tubercle bacilli swarming. Finally a resection of the head of the femur and curettment of the acetabulum had to be made, the wound then healed in good shape. He has four inches of shortening, but with a well-raised sole of the shoe he goes about and does a lot of chores on his little farm.

Another case was that of a young man who had an attack of gonorrhea. He was running his horse one night, when it fell and caught his right leg under him, and hurt the knee. In spite of elevation, hot applications, strapping and everything possible, pus formed and it had to be opened. I have no doubt it was gonorrheal infection of the knee.

A young lady was asleep one evening when the train drew into the station, and awakened as it was getting under way leaving. She was somewhat bewildered, and running out jumped from the platform. She lit on her feet, but the momentum of the train gave a side pitch to the body and as she fell her right leg was doubled under her. She said she felt something snap, but nothing could be detected that indicated a fraction, so it was most likely a torn ligament. The knee swelled, was slightly discolored, and very painful. It was elevated and strapped with adhesive strips. There was no pus formation, and the pain and soreness gradually subsided. That was eleven months ago, and she walks about and is teaching school, but the mobility of the joint is impaired at least one-half.

Fractures involving the joints are a very serious condition to deal with, and one in which more care should be exercised to avoid bad results than almost any other form of joint injuries. If a joint is ankylosed from an injury that produces adhesions, as a mere sprain, and especially if pus forms, it is one in which people are likely to look for impaired usefulness, but in a fracture or dislocation, if the joint is not just a trifle better than Nature made it, then they begin to look for trouble, refuse to pay a bill, and if they are sued the physician gets a lot of advertising in the trial, which, even if he succeeds in collecting his bill, injures him more than it is worth. For some reason fractures involving the joint are more prone to leave impaired usefulness than one where there has been pus formation without necrosis or destruction of cartilage. So they should be carefully and painstakingly reduced, watched, redressed, or at least looked at, even if we are satisfied they are doing as well as possible, for then the people see that we are doing all we can, while if we dress them as is often done, and as I have myself, leave them alone for a period that will produce union, to the people it looks like neglect. Then, if there is the least impairment they circulate the story, "Oh, he didn't look at it for four weeks; no wonder it's a stiff joint."

Compound fractures involving the joints are a formidable thing to meet, and I like to be away from home when they call in. In a Pott's fracture, where the fragment sticks out, tears the tissues loose from their moorings, throws the end of the tibia way out of place, then the mischief is to pay. Here the skill and ingenuity of the surgeon is put to its utmost even to save the joint, and the least neglect, or ignorant handling will bring an amputation as surely as night follows day.

What shall we *not do*: A little boy 12 or 13 was after the cows one evening two years ago when his horse fell, doubling his right foot under it, and produced a compound Pott's fracture. Two men of my town were called out, and after looking it over told the father they could do nothing in the way of reduction until the outside wound healed, so they laid the leg on a pillow, covered it over with an old sheet, never washed or cleansed it in any way, to

wait for it to heal up. In a couple of days it didn't smell good, and on the eighth day it was amputated four inches below the knee.

There is always a lot of discussion over how to manage a compound fracture, but it seems to me it can be reduced to its simplest terms in a few words. First clean it up, and do a thorough job of it, so we are sure it is clean. After that comes reduction of the bones, and this should be as surely done as the cleansing, and no guess work about it. The manipulation of the limb is liable to cause displacement of the fragments again, so it is good surgery to either wire the fragments, or put in a nail or a screw, to hold them in place while the external wound is being dressed and the permanent dressing applied. What of the external wound? Well, if it is clean it can be stitched up close, a plaster dressing applied at once, split down the front, a piece cut out so as to get a view of the flesh wound, then a roller bandage applied over the plaster, to hold the cut edges together, but allow it to give if there is swelling. All this takes time, but what is time compared to an amputation and a life-long cripple?

Injuries of the hip and knee are rather more important than of the other joints, because they cause more inconvenience in walking than a bad ankle, besides one can manage with a stiff wrist or elbow.

We may well inquire then what it is that happens when we have abscess and pus formation, from hip and knee injuries (and of course the same inquiries apply to the other joints). Susceptibility and resistance are two things about which we are only recently coming into a little twilight of knowledge. Why should the engineer have an abscess of the hip joint, when no direct injury has been done, and why do not all engineers have hip-joint disease? The father of the man referred to above died at 33 of tuberculosis, so he was a victim of that hereditary taint, which in some way gives enfeebled resistance and intensified susceptibility. These, however, are vague statements, and carry no weight in explanation of the real cause. It may, probably will, become definitely settled through the opsonin doctrine, and our knowledge becomes more exact, and we may be able to cultivate a higher opsonic power or power of resistance in the blood of susceptible people, thus turning susceptibility into resistance. The most we know now is, that when a joint, like the hip or knee, is injured, sometimes, so far as we can see slightly, we are liable to have deposits, effusion, blood stasis, infection, pus formation, necrosis of bone or cartilage or both, with ankylosis.

The fluids of the body, like water, must have a clear inlet and outlet for an unobstructed flow, or stasis will occur, the fluids become abnormal, and we may well conclude that under such conditions they can, and do, produce a ferment, perhaps a series of them, which fertilize and intensify in every way, the activity of the colonizing germs. The migratory character of the pathogenic and pyogenic germs are well-known now. We used to suppose that any particular family of germs was confined to the spot where their results were most manifest, but we now know that, instead of the diphtheria bacillus being confined to the throat in diphtheria, it may be found anywhere; the same with the pneumococcus. So knowing this, we need not marvel, or have to go far afield to know why we have an infected joint, when the infiltration and effusion prepare the field with fermentative changes favorable to their development.

The germs lie hidden in crypts of the body, like the tonsil and mucous folds of the mouth, and readily get into the lymph and blood streams, soon finding their way anywhere. If not moved on by the stream, but getting instead into the collection of lymph and serum, they are on the ground, ready to take advantage of the generation of any ferment conducive to their development.

We know a mixed infection is much more active and destructive than a simple one. It is not probable that the pneumococcus alone will produce fatal pneumonia, but with a mixed infection, where each probably furnishes a fertilizing element that intensifies in every way their activity, the conditions are ripe for a fatal termination of the case. So we never can tell what infection we may have, but given a mixed infection, with enfeebled resistance, and intensified susceptibility, and then have an injury

to a hip or knee, or any joint for that matter, there is sure to be trouble. In fractures involving the joints we can readily account for any ankylosis, because the provisional callus is always thrown out in abundance, more than is needed. This is really more abundant in compound fractures, so when ossification becomes complete we have formed about and in the joint, a firm bony union, not from infection, but from bone formation itself.

Now as to the management of all these cases. I believe it is good surgery, when an injured hip is presented, to put the patient to bed, elevate the leg, put on extension, and keep this up until it has time to accomplish its work. The hip joint is a complicated affair, and any injury there that causes trouble, irritates all the muscular attachments until there is a pulling of the head of the femur into the acetabulum, and this pressure alone is sometimes sufficient to cause effusion and infiltration, and to light up a destructive inflammation. If we can, by extension overcome this pressure, we relieve the source of irritation, and perhaps absorption of the effusion will take place, while if the patient is allowed to be up and about, with the leg hanging down, touching the toes to the ground, it is kept up and absorption is impossible.

If, in spite of all this precautionary treatment, pus is bound to form, then we have no alternative except to open and drain. The details of opening the abscess would be carrying coals to Newcastle here. All there is to say is that under our modern, strict antisepsis, we no longer hesitate to go into a joint, the sheath of a tendon, or anywhere we want if the requirements necessitate doing so. The pus in a hip joint is surprisingly deep, and we are liable to get discouraged and conclude we are mistaken before we get to it. I suppose we are more liable to have destructive inflammation in the hip than any other joint, especially if it is tuberculous. If, after the primary opening of the abscess there is secondary formation, we may well conclude we have necrosis, and if there is, nothing is left but to get rid of the necrosed bone or cartilage, clean out the acetabulum, put on extension and counter-extension and keep the patient absolutely quiet.

In the knee we are better able to open and drain, and get rid of all the infection. There should be no hesitation about going into the knee joint if necessary, cleaning it by irrigation and draining. I believe extension here is good surgery, as it quiets the muscular tension and facilitates drainage.

We all take a just pride in good results, both for the patient's good, and our own reputations. A stiff, sore joint is a great hindrance and drawback to the lifework of anybody, and the knee and hip are most so of all. A lame woman is an especially distressing sight, and touches not our pride alone, but our sympathy as well, so the better results we get the more cause for congratulations all round.

In simple sprains too much precaution is impossible. Well knowing the migratory character of disease-producing germs, well knowing that effusions and stasis produce fruitful fields for their development and intensifying their activity, I believe a limb ought to be placed at absolute rest, well strapped with adhesive strips, elevated, and if thought best apply hot water bottles about the joint. Some prefer ice, and there is some argument in its favor, especially since heat favors germ production, while cold retards it. Applications of any kind are not, in my judgment, necessary, but often the necessity arises of allaying the anxiety of the friends. If we feel certain of no harm coming from any procedure, and can allay their fears, it is not bad practice to concede them that much. In all cases the tonsils should be carefully examined and if they are large, thick, full of crypts and cheesy masses of foul-odor they should be cleansed and treated daily. The same with decaying teeth and pyorrheic gums, for I believe here is often a source of trouble.

We examine and cleanse the mouth in typhoid fever, pneumonia and any form of continued sickness. Why? Because we fear infection from this source. Then, if infection is liable in these cases, it is equally so in others.

When a child is brought in with some trouble in the hip we never know what it has been doing, whether or not it has fallen on the hip, or any one of a dozen things that might happen to it. The family history is of the highest importance here, to eliminate tuberculous taint,

perhaps malignancy. It may be a beginning Pott's disease, a spinal lesion or what not.

The knee is not so liable to sprains as the ankle, but it is often injured, especially in rural communities, where injuries come from falling under a horse, from a plow, mowing machine, or other accidents producing a bad twist which may tear the ligaments and produce an effusion into the joint.

Finally in résumé: The simplest injuries are liable to produce very serious results: Stasis of the fluids of effusion and infiltration furnish fruitful fields for colonization of disease-producing germs, where the mixed infection intensifies all the phenomena of their activity.

The migratory character of disease-producers accounts for the infection of remote parts of the body.

Hereditary influences produce feeble resistance, and intensified susceptibility, and a ray of light shines through the opsonic index, by which we may finally be able to change hereditary influences.

In fractures involving the joints use care in dressing, early passive motion, and prevent if possible an ankylosis. In compound fracture, cleanse the wound thoroughly, adjust the fragments, watch it all the time, and as soon as possible make passive motion.

Finally, in any form or sort of joint injury do more for it than the simplicity of the case would indicate. If it did not need it, no harm is done, while if there is trouble after, no regrets follow.

DISLOCATION OF SHOULDER WITH REPORT OF A CASE.*

I. D. STEFFEN, M. D., ANTIGO, WIS.

The work of the railway surgeon must of necessity be of a practical nature as emergency surgery constitutes a large part of his work. When these cases arise he must, suddenly, without any theorizing, be able to apply those principles and methods that will conduce to the benefit, comfort, and future usefulness of the patient. Without any warning he is called to a railroad wreck where he may find a crushed limb, a fracture of one or more bones, or a dislocation of one of the smaller or larger joints. He must, therefore, be able to decide immediately what principles to apply. The abdominal surgeon, the stomach and gall bladder surgeon or gynecologist can study their cases and take time to deliberate on this or that method of procedure. Meetings of this kind give us an opportunity to interchange ideas and experience from a practical standpoint, because we profit by our own experience and the experience of others.

I therefore bring before you a subject of practical importance, although trite it may be to some of us. During the past year 7 cases of dislocation of the shoulder joint came under my observation, more than the average in any one year, and I have therefore chosen this subject for this brief paper.

The shoulder is an enarthrodial or ball-and-socket joint. The bones entering into its formation are the large globular head of the humerus, received into the shallow glenoid cavity of the scapula, an arrangement which permits of considerable movement, in fact, the only joint that has that extreme freedom of movement. It is protected by strong ligaments and tendons which surround it and by an arched vault above formed by the under surface of the coracoid and acromion processes, and the coraco-acromial ligament. The capsular ligament completely encircles the articulation, thicker above than below, remarkably loose and lax, and much larger and longer than is necessary to keep the bones in contact, allowing them to be separated from each other more than an inch. The glenoid ligament is a fibro-cartilaginous rim attached around the margin of the glenoid cavity. It is continuous above with the long tendon of the biceps muscle encircling the margin of the cavity and uniting at its lower part. This tendon also passes through the capsular ligament inclosed in a sheath of synovial membrane. The tendon of the biceps is thus enabled to traverse the articulation, but is not contained in the interior

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of the synovial cavity. (I believe this tendon gives us considerable trouble in certain dislocations and will speak of it later.)

Over 50 per cent of all dislocations are of the shoulder joint. In the other joints where we have not that peculiar anatomic construction, that freedom of motion, with the same force exerted, a fracture will be produced before a dislocation takes place.

The two directions in which displacement is most frequent is the anterior and the downward. The former may be sub-divided into subcoracoid and subclavicular. The downward into axillary and subglenoid. Fowler states that the subcoracoid embraces three-fourths of all shoulder joint dislocations. This dislocation may result from direct force by driving the head of the humerus forward and inward, but usually occurs by falls on the hand with the arm in a position of super-abduction. In this position the humerus is forced against the inner and lower portion of the capsule, while the highest point of the greater tuberosity rests against the upper margin of the glenoid cavity, the surgical neck against the acromion process. When the force is continued with the arm in this position, the humerus becomes the lever, the glenoid cavity and the acromion the fulcrum, the head is forced through the anterior and inferior portion of the capsule, and escapes into the axilla.

The difference between axillary and subglenoid dislocation is only one of degree. In the former the capsule and the attached tendons are ruptured to a greater extent. In that case the head comes to lie farther down against the infraglenoid tubercle. The symptoms are about the same, except in the extreme anterior cases. The arm will be slightly abducted. The contour of the shoulder is flattened above and a depression exists below the acromion. The globular shaped head is either seen in front or in the axilla. The elbow is always a little way from the side of the chest and the patient invariably complains of pain in the shoulder.

Other forms of dislocations may take place, such as the erect dislocation and retro-glenoid, but these are so rare that I will not discuss them.

Reduction.—This concerns us mostly. When we are called to treat a case of shoulder joint dislocation, the question naturally arises what method shall I adopt to get the head of the bone back in place? In my earlier experience and the experience of others, when we were unable to reduce by the extension method, Sir Astley Cooper's method was resorted to by means of pressure with the heel in the axilla and extension combined, but these are now very generally abandoned, as they are not in accord with the physiologic anatomy of the injury developed in recent years. Force was the most important method of the old methods, while due regard for the resisting structures and gentleness characterize the method now used.

The method with which I have had the best results, and seems to serve the purpose best, both for patient and surgeon, is what is known as the Kocher method. Indeed, I want to make a special plea for it and urgently advise those surgeons who have not used it to try it when the opportunity presents itself. It is easy and as a rule the luxation is quickly reduced.

Of the cases that came under my observation the past year, 5 were subcoracoid and 2 subglenoid. Two occurred in the same individual, above six weeks apart, but not in the same shoulder. There was nothing of particular interest in either of these two cases. Reduction in each case was readily made by the Kocher method and without an anesthetic.

Three of the remaining five were similar to these two and gave rise to no difficulty and readily reduced by the same method.

The remaining 2 were large muscular men, both railroad employes; one an employe at the round-house, working nights, got into a fistic encounter with another employe and in striking at his antagonist he missed his aim and fell forward, sustaining a subcoracoid dislocation of the right shoulder. I attempted to reduce the dislocation at his home, but the patient was very sensitive to pain, and no conveniences at hand, I took him to the hospital and had an assistant administer an anesthetic, and as soon as the parts were relaxed, I reduced it by the Kocher method without any difficulty.

The other case that gave me the most trouble

was also a railroad employe. At the time he received his injury he was loading ties into a box-car, he being in the car between the two doors. In handing the ties to him by another employe, who was on the outside, in some way he was pushed out of the opposite door and fell to the ground, sustaining an anterior luxation of the left shoulder. He was brought to the hospital about two hours after the accident. Upon examination I discovered the head of the bone quite well forward, much more so than in any other previous case that I had. There was considerable swelling about the joint and it was impossible to make even an attempt at reduction without an anesthetic, which was administered, and for over an hour all attempt at reduction, with the help of an assistant, seemed to be futile. After another attempt we got it as we supposed in place. There was considerable traumatism produced by the manipulations, increasing the swelling about the joint materially. In about two weeks after, the swelling had very materially subsided, but the patient had considerable pain and we noticed that the head of the bone was not fully in place. Another anesthetic was administered and after breaking up all adhesions the bone was completely reduced. After this his pain left, and in course of time proper passive motion commenced and after a period of a little less than three months he had fairly good use of the arm, motion being somewhat limited especially in attempting to raise the arm from the body.

In studying this case I was at a loss to know what the resisting factor was and indeed do not positively know now. It might have been the untorn portion of the capsule hugging the head of the bone, but I am of the opinion that one of the causes which mitigated against easy reduction was a sling around the neck of the humerus, made by the long head of the biceps with that of the triceps. This condition sometimes takes place. In very difficult cases the open method, cutting down on the parts, is sometimes advised, and this probably was one of the cases where it should have been applied.

Once in a while a case will arise that baffles all skill and all methods, but I am firmly convinced that the Kocher method will reduce 75 per cent of all dislocations of the shoulder joint. The method in brief is as follows:

The patient may be put in the sitting posture or upon his back on an operating table. First, the arm is seized at the elbow with one hand and with the other grasp the wrist, then adduct the arm with strong traction downward. Second, rotation outward so that the flexor surface of the forearm is directed forward. Third, elevate the elbow and rotate arm inward, bringing forearm and hand over the chest. If reduction is now complete, and this is often indicated by a perceptible jerk, the hand will rest on the sound shoulder.

In this method of reduction the anterior portion of the capsule as well as coraco-brachial ligaments are put on the stretch on which the head of the bone rotates and approaches the glenoid cavity, then after the arm is rotated outward and the arm is elevated to a horizontal position, the ligament and capsule are relaxed, and do not further prevent the bone from passing into the glenoid cavity.

During any of the methods manpulations by an assistant, and to steady the shoulder, will be of signal service.

After reduction is complete the principal point in the dressing to be observed is to well support the elbow by a proper-fitting bandage or sling, as the arm should not be allowed to drag upon the torn capsule.

Such in brief is the method above all methods, and which I firmly believe, with few exceptions, if properly performed, will prove successful and give us the best results. In many cases it enables us to reduce the dislocation easily and without an anesthetic.

DISCUSSIONS ON PAPERS OF DRS. WOODBRIDGE AND STEFFEN.

Dr. J. D. Seba, Bland, Mo.: I desire to commend the paper just read, as it goes into details very fully. I rise simply to call attention to one point that was not mentioned in the paper; that in some people dislocation of the shoulder joint is comparatively a trifling affair. I have a son who is very loose jointed, and he gets his shoulder joint dislocated sometimes once or twice a week and can put it back

himself. I have had my shoulder dislocated several times, and my wife sets it quite readily. So there we have it! One whose shoulder joint is thrown out thus easily does not suffer very much inconvenience.

But I have seen cases where it is very troublesome and results in serious complications. I recall that in one case the patient seemed to have an easily reducible joint, the doctor put it back, but did not bandage it securely; it went out again, the patient let it go, serious complications resulted, and the doctor was sued for $10,000 and the jury awarded $5,000. So we should always be on our guard in these cases, for it has been my personal experience that they vary a great deal. In some people the dislocation of the shoulder joint is a trifling matter, it slips right back, while in other cases we have to give a general anesthetic to reduce it.

Dr. G. F. Beasley, Lafayette, Ind.: I have a brother who had the shoulder get out of joint and it was put in by the doctor in the usual way, and he tore everything to pieces. That boy would get his shoulder out of joint if he sneezed hard, but he could put it back alone if he could get hold of the lower board of a fence. If a shoulder has been out of joint once it comes out quite easily again. The Kocher method is good, but I have seen some cases in which it would not do.

I do not know where I learned this, perhaps by reading it in some medical journal: Lay the patient flat on a table, put the arm of the side on which dislocation has occurred right around your body, getting the elbow in about the position it was when it went out, and by making steady pull, the patient anesthetized, the dislocation will be reduced. I do not see how the long head of the biceps can get down underneath the head of the humerus, although it may be possible; but the method referred to is good. A general anesthetic reduces the pain and flexes the muscles, and you do a great deal less injury to the joint than if you attempt to put it in without anesthesia. Whenever a person has a pain he flinches, I do not care how much "nerve" he has, and I think in all those cases—especially of primary dislocation of the shoulder joint or other joint—the patient should be put under the influence of a general anesthetic. And in regard to the surgeon giving the anesthetic himself, I am glad to know that one man is brave enough to risk criticism and do this himself. In putting the shoulder joint in place you can give the anesthetic yourself, it is not necessary to hunt up another doctor to do it. I think it is a mistake to go, especially at night, and try to get some one to give an anesthetic to put the shoulder in place.

As to the matter of small injuries bringing about bad results, I remember seeing the case of a boy who stepped on a pin. The mother put some camphor on the slight abrasion and thought nothing more about it, but it suppurated and the surgeons had hard work to save the boy's foot. In another case, a little girl, a Russian Jew, poorly nourished, sprained her ankle. I saw it after perhaps several weeks. I opened it on both sides, and found that the bone had necrosed, and finally it became so bad that the only thing we could do to save her life was to make amputation. So we cannot be too careful of those apparently little things. Many persons pay no attention to a sprain, they treat the matter lightly, but, especially in a sprain of the ankle, the case should be treated carefully.

Dr. J. C. Dodds, Champaign, Ill.: I have been listening here for a couple of days, expecting that some of these gentlemen of large experience to say something of the Bier treatment in cases of injury of the extremities, and especially of the smaller joints. I rise simply to say that after a slight experience of two years, the Bier treatment appeals to me as one of the elegant things in treatment of injuries of the extremities and of the joints. With this treatment, immobilization of the joint and extension are two of the prime necessities. This treatment, with the gauze wrapped around the joint thoroughly saturated with glycerin and alcohol for its osmotic action upon the skin and capillary circulation, will produce results agreeable to the patient. Under that method, many of these cases will not go on to suppuration.

Dr. Steffen (closing): I do not see that there is very much for me to say. The cases

that the gentleman from Missouri refers to are what we call "habitual luxations."

The point of importance in the dressing, remember, is to well support the elbow joint, not to have the arm drag upon the torn capsule. Reduction of the dislocation in these cases is of great importance, both to the patient and the surgeon. Only a short time ago I was on the witness stand in a malpractice suit, in behalf of a doctor who attended a farmer in reduction of dislocation of the shoulder. I do not know whether the dislocation was properly reduced or not. The doctors who were called in behalf of the defendant simply testified that the methods which he used were the proper ones in such cases, but, as is usual in malpractice suits, the jury awarded the plaintiff a verdict, the amount being $800. So, as has been said here, we should be careful in these cases, not only in reducing the dislocation, but also in the proper application of dressings.

DISCUSSION ON PAPERS OF DRS MINNEY AND SHORE.*

Dr. Charles D. Thomas, Peoria, Ill.: Dr. Minney in his paper has given, I think, a very excellent treatment of this subject. It is a question as to just what is intended by the doctor, whether it is a question of the way to follow out in treating a case of deafness as a practitioner, as a specialist, or as it relates entirely to railroad examination. I have no doubt the doctor intends it mainly as a prompting and as a manner and means to follow in railroad examinations. In following out an examination the watch is about discarded now in the examination of a railroad employe and the acoumeter and the whisper voice are used almost entirely instead.

The acoumeter is the instrument invented by Politzer and it has a definite and positive click and noise. Watches vary and the authorities found that that was rather an indefinite quantity and very unjust at times. You have often noticed, probably, that lots of patients when you are examining them will not hear a watch at the 40 inches which the regulations require. Sometimes they won't hear a watch more than 10 or 12 inches from the ear, and if you were to stop at that you would do a great injustice to the applicant. But the acoumeter is heard at a much more remote distance and patients very often, where they can only hear the watch at 8 and 12 inches, will be able to hear the whisper voice at the full 20 feet, making them 20/20. The acoumeter will be heard even further than the whisper voice is heard. Lots of patients who are unable to hear the watch at 10 inches are able to hear all conversation in a whisper voice at the proper distance, so you see it would be very unfair to them to cling to what you get from an examination with the watch. Therefore it is very justly almost entirely disregarded.

I think it is a pretty good plan for the examiners to get on an engine once in awhile and take a ride. Get on with one of the engineers of your division and ride with him for a number of miles and you will have a great deal more sympathy with him and understand the situation a great deal better. The noise and the clatter of the bell and the whistle and the rattle of the engine is fierce. When you get off from there you are almost staggered with the amount of commotion in your own head and I think everyone will wonder how the engineer and the fireman especially—it does not apply so much to the conductor of course—you will all wonder how an engineer keeps his hearing for the number of years that he does. We have on one division running out of Peoria a Mr. Ewing, who has been on there ever since before the war, and his hearing is still about normal. Of course in regard to the older employes, I guess we all have instructions to be a little more lenient with them than we are with the newer men. But it is perfectly remarkable the amount of noise and commotion there is on an engine, and the amount of dust and air and liability to draft. It is perfectly remarkable to me to think that the men hold their hearing so well. Of course dust and draft are the great producers of catarrh. Catarrh is the great producer, as Dr. Minney has said, of surely 80

*The papers appeared in the March issue.

per cent of the cases of deafness. We have dust, gases, contaminated air, colds, catarrh, then follows deafness. The doctor has very properly suggested examination of the nose and throat in all patients who have any premonitory or any beginning symptoms of deafness because the enlargement of the turbinated bodies or spurs that are there, that project out from the septum, interfere with the first demand of good hearing and of a normal mucous membrane in the nose and throat, namely, proper ventilation. The keynote to the situation, as we all believe, is proper ventilation of the post nasal space.

Dr. W. C. Bane, Denver, Colo.: I want to say that I heartily approve of Dr. Shore's up-to-date method of dealing with tonsils, that is, doing a tonsillectomy rather than a tonsillotomy, which is usually what occurs when you use the tonsillotome. It is impossible to remove a tonsil completely with the tonsillotome where there are adhesions, and, as the doctor has stated, it is necessary to break up those adhesions, detach the pillars, then elevate your tonsil and cut it off at the base. You can do that with scissors, with a knife or you can use the tonsillotome then, if you wish, having the tonsil completely separated, and elevated with the vulsellum forceps. It has been my habit to use the cold wire snare for completing the operation after breaking up the adhesions. I have had made recently an enlarged Wright's snare that to my mind is an ideal instrument in the way of a cold wire snare for tonsillectomy. The ordinary Wright snare as sold is not heavy enough for the purpose. Having the tonsils detached, elevate with the vulsellum forceps, you slip the wire into the base of the tonsil, and then with the ratchet movement tighten your wire down upon it until you have gotten a firm grip at the base of the tonsil, then you can stop and wait for a few moments, if you think best, allowing the blood to coagulate in the vessels and then complete your incision and you will not have very much hemorrhage, in fact very little hemorrhage from that part of the incision.

As to the vulsellum forceps, the Andrews vulsellum is an excellent one and I use it quite a good deal; but in holding a very large tonsil you are apt to crush it and your vulsellum will cut part way through. Sometimes in a child, if restless, it will tear out the hold and then you will have difficulty in securing the soft tonsil. I have added to the vulsellum an extended ratchet that allows of gentle tightening of the forceps on the tonsil, giving a firm hold on a large tonsil and yet not apt to pull out. The advantage in the extended ratchet should be apparent.

Dr. A. H. Andrews, Chicago: I heard that part of the doctor's paper referring to the removal of tonsils. I want to mention one or two points in this connection, first with reregard to recurring peritonsilar abscess as the result of repeated infections of the tonsils. We are all familiar with cases of recurring abscess, where the tonsils have been operated upon in the hope of stopping the attacks of tonsillitis, but after the operation the patient has had quinsy a little oftener than before.

Now, I want to say that in my experience—which has been somewhat extensive—I have yet to see my first case of quinsy in a patient who had had his tonsil extirpated. It is always in the cases that have had their tonsils decapitated, sliced, cut off, tonsillotomy instead of tonsillectomy. Tonsillectomy is not an easy operation. In my earlier experience I was in the habit of putting a tonsillotome in the throat, having counter pressure made on the outside, and taking out what could be brought into the fenestra of the instrument. If the only object is the removal of mechanical obstruction this answers the purpose. If there are other troubles such as otitis media, such as recurring pharyngitis, recurring tonsilitis, this operation is not, never was and never will be sufficient. Nothing short of total extirpation of the tonsil will answer the purpose. It is not alone the hypertrophied tonsils that should be removed. I do not think the doctor mentioned the atrophied tonsil. The hypertrophied tonsils do harm by gathering infection and by mechanical obstruction. The atrophied tonsil is practically a foreign body in the throat and is a source of irritation, innocent-looking but harmful to the patient. They usually are overlooked entirely or pass for innocent tonsils, but when they are a source of irritation, if

you will remove them, you will gain the everlasting gratitude of your patient.

Now, with regard to the question which I have been asked to discuss, the treatment of otitis media: I would say that there are a number of different pathologic conditions of the ear, causing deafness which pass for ordinary otitis media. There is sclerosing ostitis, a disease affecting the labyrinthine capsule. There is sclerosis of the middle ear and there is the true chronic non-suppurative otitis media. Sclerosis of the internal ear, and sclerosis of the middle ear, is absolutely not amenable to any known treatment at the present time. Chronic non-suppurative otitis media is amenable to treatment. It cannot always be cured but can always in any stage of the disease be benefited. The most important thing for the physician is to make a diagnosis of the conditions present, and not to undertake to treat those cases which are not amenable to treatment. If he does, he will injure his reputation. Do not turn down those cases which are amenable to treatment, or someone else will treat them and help them and the doctor's reputation will suffer. I cannot go into the question of diagnosis. That is a question largely for specialists and I do not think there are many of that unfortunate class here.

In the treatment of chronic non-suppurative otitis I find four things to do—first, attention to the nose and throat; second, inflation and massage of the middle ear; third, injection of medicine through the Eustachian tube into the middle ear; fourth, electricity—and I will add a fifth, attention to the general health. I believe that many of these cases are due to vasomotor disturbance, from some disturbance of the general health rather than any special local condition, so we must look after the general health of our patients suffering from chronic non-suppurative otitis. Now there are three stages in the pathologic process of chronic non-suppurative otitis media—first, the simple stage, in which there is congestion and edema of the soft structures of the middle ear; second, because of the long continued congestion there is a proliferation of the connective tissue. This is the hypertrophic stage; the third stage is brought about by the contraction of the connective tissue lessening blood supply, lessening the nutrition and bringing on atrophy of the soft parts.

Now the first stage is curable, the second stage can be helped a great deal, the third stage can only be helped a little in the majority of cases. Another important thing for the physician to know when a patient comes to him complaining of deafness and tinnitus, is that if it is amenable to treatment at all, the earlier he gets at the treatment, and does the proper thing, the more successful will be the treatment. The patient who goes on year after year waiting until he gets ready to have his ears treated is losing valuable time and will never be able to get the result which he might have secured if he had had his ears treated early.

Dr. F. Vinsonhaler, Little Rock, Ark.: This is a subject that interests the general practitioner very largely because he has in the majority of cases the tonsils to remove. It is a question with him as to how best to do it. I think the explanation of technic in tonsil operations often serves the purpose of confusing the general practitioner. This summer it was my pleasure to see a good deal of this sort of work in the clinics in New York and Boston, and I made a special point to get around to the different institutions and see exactly what they were doing. In the Massachusetts Charitable Eye and Ear Infirmary I found it was necessary to get up at 7 o'clock in the morning in order to see any of the tonsil work. The work was done entirely by the house surgeon. None of the visiting staff operated upon the tonsils. It was not considered of sufficient importance to interest the chief surgeons in connection with the hospital. The anesthetic used is ether; I didn't see anything else used while there.

The patient was brought in in an operating chair wheeled into the room where the operation was performed, and the chair pushed in such a way that the patient assumed French's position, that is, when the tonsils were removed the patient was in the upright position while still under the influence of ether. The mouth gag was inserted, the tongue was depressed and the instrument for cutting the an-

terior pillar loose from the tonsil was used. The house surgeon said he never touched the posterior pillar and he never thought anybody else did. He thought that was rather talked about than done. After the separation of the tonsils from the pillars he seized the tonsil with the forceps; after that he passed a snare, passing the wire directly over the tonsil forceps and down to the tonsil, removing it. Some submerged and small tonsils that could not be seized with a snare he removed entirely with a Farlow's punch, that is, he would go after the tonsil and simply punch it out, pull it out, and said if anything suited him better than another thing it was to get hold of a tonsil and drag it out; and that he knew of one operator who took the tonsil out with the thumb. That is a method that some of our practitioners use in certain sections of the country when they get into a political argument, enucleation of the eye with the thumb. In this instance, he said, they had one operator who removed the tonsil with the thumb; didn't use any other instrument. I told him I should very much like to see the operation; I had seen it used on the eye and it was a success.

In a New York institution I expected to see a great deal of very fine technic. I found the patients were brought in there also under ether and the tonsils were removed first with the much-abused Mackenzie tonsillotome and after the tonsillotome had cut off all the tonsil that could be cut off they went in with a punch and cleared out the balance of the tonsil, and that I found to be the universal operation in the clinics in New York City—almost the universal operation. I have been informed also that there is one operator who insists on hanging his patients up by the heels, has a ring in the center of his operating room and passes a cord around the heels of the patients and suspends them so that there is no possibility of hemorrhage entering the trachea and in that way the child becoming strangled.

I agree with the doctor in the necessity for the complete removal of the tonsil, but it is by no means an easy thing.

Question by a Member: By the punch, do you mean a curette?

Dr. Vinsonhaler: A punch, something like the conductor uses in punching your ticket, but a good deal larger, it simply seizes the tonsil and cuts it off. The Farlow punch seems to be the one most commonly used. Now, the doctor hasn't mentioned this, but it is a fact that in most of the operations the adenoid operation was done also, but there seemed to be a great deal more technic and care in the tonsil operation than there was in the adenoid. That was about the kind of work that I saw while I was away, and unfortunately I had to take one of my children for the removal of the tonsil to a specialist who has written on this subject in a very eloquent manner. He sat the child in a chair, took out a Mathieu's tonsillotome, which we are all told belonged to the dark ages, removed both tonsils. And did it very nicely. The child hasn't had any trouble since, and I said, "Doctor, why do you write all of these eloquent articles about the technic, and when you come to do it for a brother practitioner, do it in the simplest manner?" "Well," he said, "Doctor, these refinements are only necessary in special cases, in the majority of cases we simply take the tonsils out and the man who does it thoroughly in that way is successful."

Dr. Charles D. Thomas, Peoria, Ill.: I think the doctor who spoke last has given out a very good idea, that tonsils can be fairly well removed without any great amount of agitation, and all the doctors do that work right along. There is a great difference in the way of taking out tonsils, a great difference in the cases, as well as a great difference in the result.

A great many tonsils are well elevated and protrude out into the right of way and they can be quite completely taken out by a tonsillotome, and practically a perfect tonsillectomy as every one has experienced. But there are a great many that cannot be taken off that way, and then the operations that are more confusing or have more danger to them must be done. The operation of tonsillectomy, in my way of thinking, is done best as the last doctor described. You use the vulsellum forceps, but the vulsellum forceps will pull out lots of times and put you into consider-

able trouble. Many tonsils are soft and friable, you grasp hold of them, make a little tension to pull them out from between the pillars and they tear out.

Personally, I have had constructed rather a special form, one that has a clamp along with it just beyond the teeth of the forcep, so that where the teeth would pull out, these grasp just like tweezers would take hold. Of late I have not had the trouble that I used to have; then taking hold with the vulsellum forcep you throw the sling of your cold snare right over it until you get well down. But before that I should say you usually tear the tonsils loose with the forceps that are especially made for that purpose. You throw in the forceps and with these two broad, cupped blades that come together like that (indicating), you grasp the tonsil above and below and you press down on the forceps, it tears the tonsil loose above and tears it below and gives you an opportunity then to grasp it, then you throw your sling over the vulsellum and make the wire sling and enclose the tonsil and make it bear right down against the mucous membrane, in that way you decapitate the tonsil very perfectly.

My own child, a boy who was rather stout and sturdy, a lymphatic perhaps, had very large tonsils, and rather alarming glands came on his neck, an enlargement of the lymphatics here. I took him to the hospital and the surgeon made an exploratory puncture into two of them to see if there was pus in them. We found pus in one and not in the other. I took him up to Professor Ingals, he made a perfect extirpation of the tonsils, and did it in this way that I have just tried to describe. Those glands (and I think this is of some interest and some concern), those glands all disappeared; and the surgeon in the case at that time had the fear, spoken and unspoken, that they were tuberculous glands; they seemed to behave in that way, but they have all disappeared and it is my perfect conviction that they were not tuberculous and will never return. I think the taking out of tonsils in the great majority of cases will drive away enlarged lymph glands in the neck and they will never return.

The use of adrenalin as an injection into the tonsils to prevent hemorrhage is to a certain extent a delusion and a snare. It sounds very nice to read of the use of adrenalin or adnephrin, and we feel that they will do a great deal of good, but when you come to using them they don't do nearly the amount of good in operations where the bone is involved in the nose, or in operations on the tonsil, that we have been led to expect. They bleed furiously. I have never been able to take out a tonsil except in the case of semi-adults where the hemorrhage was not considerable. In operating with the tonsillotome in semi-adults you don't get very much hemorrhage. These are very easy operations, and these operations are properly done with the tonsillotome. But in children whom you have to anesthetize and make a thorough extirpation you may swab your adrenalin over the tonsils and then use cocain. But I am sorry to have to disagree with the first speaker; in my experience it has done but very little good. It has done some good, but the tonsil wound will bleed and the adnephrin will not prevent it. you must turn the child over on its side. They will bleed furiously, the blood bubbles out of the nose, it bubbles out of their throat, they respire in and out through that blood, and it is surely anything but a pleasant operation. I have done lots of tonsillectomies under anesthesia and without, and I have done lots of mastoid operations and I have done some appendicitis operations before I took up the special work of the ear, and I give you my word I would rather do an appendicitis operation or a mastoid operation than to do a tonsillectomy under an anesthetic. If you have a semi-adult you can do an operation without so much blood. The patient is able to expectorate it out and get it out of the respiratory tracts, but adrenalin does not do what you hope it will do. At least that has been my experience.

Dr. W. D. Fulkerson, Trenton, Mo.: I would like to ask a couple of questions on this subject. I am personally interested in this matter. These talks have all been instructive and interesting and I approve of all the operations on somebody else's child, but I have a

little fellow 5 years old who had diphtheria when he was 18 months old which left him with badly hypertrophied tonsils, and I have been very much in hopes something would happen which would improve that condition. I would like to ask if there is any local application that would benefit those conditions or ameliorate them? Is it necessary to extirpate them in every case?

Another thing, in regard to liability to a fatal hemorrhage, does that ever happen? I have been uneasy about both of those things.

Dr. L. Reynolds, Horton, Kans.: It has occurred to me during this discussion and the reading of the papers that the tonsil has been regarded as the chief factor in pathologic developments in this neighborhood, and it may leave the impression generally that they are the chief causes of ear trouble. It is my belief that adenoids cut a greater figure pathologically in their relation to the ear than tonsils, and they are so very generally and frequently associated that they could hardly be considered separately without making an improper impression, it seems to me. So it occurred to me that we ought to mention that subject, indirectly at least, in the discussion.

Dr. H. A. Leipziger, Burlington, Iowa: The question has been asked by Dr. Fulkerson in regard to whether there is ever a fatal hemorrhage, and I may be able to shed a little light on that question through an experience that I had in which there was a very alarming hemorrhage following tonsillotomy, not tonsillectomy, in an adult, a woman, and that case gave me occasion to look up the question of fatal hemorrhages following operations on the tonsils, and I arrived at this remarkable information:

I looked through a great deal of literature and found in the text-books on throat diseases that reference was made almost by every author to alleged fatal hemorrhages after operations on the tonsils. I took quite a little trouble to follow up these authorities and the references. I went through a large number of volumes of the *American Journal of the Medical Sciences,* that being one of the most reliable sources, and found some references for the last forty or fifty years, and in no case could I put my finger on any reliable statement as to a fatal hemorrhage. There were always references and cross-references. And when I came down in the literature to the original articles, or as near to the original articles as I could, I couldn't find one case in which fatal hemorrhage was absolutely reported as reliable. Alarming hemorrhages there were any number, hemorrhages that required the tying of the carotids and extensive resources applied for the stopping of the hemorrhage, but .I couldn't find a single case in all the literature where a man reported a death from hemorrhage following operation on the tonsils. Local applications and all other appliances and methods for the stoppage of hemorrhage (in my case adrenalin included) proved of no avail. The fainting of the patient finally, the syncope attending the hemorrhage which was of a trickling, dripping nature and which went into the patient's stomach and which the patient vomited from time to time when too much blood got into the stomach, the syncope I believe and the hypodermic of an anodyne in my judgment at the time were the means that arrested the hemorrhage more than anything else that was used.

While my investigations five or six years ago had been rather thorough I concluded that perhaps cases of fatal tonsilar hemorrhage had been reported since that time and had not come under my observation. The doctor with whom I spoke, and whose opinion on this subject I would rather take than my own, because he is an excellent authority in this line of work, referred to Sajous as having reported a fatal case in his text-book. During the lunch hour I took the time to look up a library here in a doctor's office and I have here two citations which indicate that my specialist friend is mistaken and that the position I took regarding fatal tonsilar hemorrhages is correct. Six or seven years ago Bosworth wrote a one-volume book on diseases of the throat, and he was my authority for the statement to a large extent that I made. Now Bosworth has rewritten that work and it is now a two-volume work. It is recent and up-to-date. He devotes two or three pages to quotations from the litera-

ture of the whole world in regard to the hemorrhage that follows tonsillotomy or tonsillectomy, and after reviewing this subject more extensively than any other work that I could get hold of he winds up with the statement (after mentioning case after case of *very alarming* hemorrhages) on page 357 (157) of Volume II: "I know of no case reported in sufficient detail to warrant accepting the reference to death from hemorrhage."

Sajous (on page 293 of his work) says: "Profuse hemorrhage occurs in one out of five hundred cases, alarming hemorrhage once in one thousand cases." And he had the misfortune to have had one of the latter, a student who had seven consecutive hemorrhages and the case did not terminate fatally; another, a boy of 17, who had an alarming hemorrhage several hours after operation, which did not terminate fatally. I am very glad that the correctness of my statement this morning is corroborated by these authorities and am perfectly free therefore to reiterate the statement I made this morning, that fatal hemorrhage, as far as I can find out, has not been satisfactorily demonstrated after operations on the tonsil, unless a report by Damionos (*Wiener Klinische Wochenschrift,* February 25, 1902) is correct. He says that out of 150 reported cases of alarming bleeding, 7 were fatal, 3 were after operations by charlatans, 2 were in children under 13, which is opposed to the general belief that severe bleeding never occurs in children. I am inclined to pin my faith, however, to Bosworth's careful investigation and to his conclusions.

Dr. J. E. Minney (closing): Mr. Chairman, they kind of sidetracked me; that is the way with these young fellows, you know they will get away with the older ones. They will do it every time. I am glad to see these new inventions and new methods pursued. But you know that all men, particularly specialists, become visionary. I do not mean by that anything derogatory; it is the imagination, the imaginative man who makes the progress. It is imagination in man that blazes out the way; he is the pioneer, and reason proves whether the way blazed out by this imaginary man is correct. Dr. Andrews is not a very imaginative man, but just enough so to be very progressive. My friend, Dr. Vinsonhaler, here, is also a progressive man, not quite so visionary; he is one of these solid, substantial fellows. He looks at things as they are. You know he was raised down in Missouri; you have to show him. This other gentleman, Dr. Thomas, pleased me very well with his remarks. He did not quite understand my paper.

You are not making your entire living by railroad surgery. If you are, then my paper was a little out of order. But it is a mongrel if you notice. It includes railroad practice, and incidentally—incidentally the general public, or general practice. That is the idea. If practiced it is a source of revenue and a means of doing much good.

Respecting the examinations, we are required to use only the acoumeter and a whisper. On the Santa Fe the examiner is required to use a watch, the whisper, the tuning fork, and the acoumeter. Why? It is not our only duty to find out whether there is in progress a condition which will render him unfit for service in a short time. That is not all. Suppose you have an accident and you have examined only with the whisper and the acoumeter. The man some day holds his watch to his ear and finds that he cannot hear it but a few inches away or pressed against his ear, and, convinced that the injury, though remote, is the cause, and a damage suit results. Suppose this case comes into court, a man is hurt who thinks he heard perfectly before the accident, but at the present time can only hear a watch four inches away or when pressed against the ear. How are you going to impress the jury that he could not hear the watch unless a record is made of such a test? But here is the record of this case, showing the man's hearing was the watch pressed against his ear. Such evidence is essential in this class of cases. He may have heard the whisper and the acoumeter and passed the required examination.

So if we want to do not only our duty, but a little more than our duty (and the man who does a little more than his duty is the man I

think who is in the line of progress and advancement) for the protection of the road every ear should be examined by the watch, for that reason alone—as a protection to the road. I don't know that further discussion is necessary. The point is this—here is a fireman who comes up for examination for promotion to engineer; he has worked three or four years; he has passed his examination for fireman; a catarrhal condition is now present, dulling his hearing; you question whether he should pass, and you know the condition and you can save that man in all probability. Why not do it?

Respecting the removal of the tonsil, why do you want to remove the whole of a tonsil when there is only a portion of it diseased, any more than an ovary? I do not know the function of the tonsil, do you, Dr. Andrews?

Dr. Andrews: No, sir; none, I think, any more than the appendix.

Dr. Minney: That is begging the question. We do not know its function. The appendix is rudimentary, and I am not sure but what it has a function; we do not know yet what the function is. For a long time we did not know the function of the thymus gland. We do know that it has a vital function now. If it is all removed, death finally results. We have had no trouble with the remorrhages in removal of the tonsils.

Dr. Andrews: The only function that I have ever been able to discover—if you will allow me to answer that question—the only function of the tonsil is to make trouble for the patient and money for the doctor, unless it is to make people take care of themselves the same as weeds make us take care of our corn in the field. That may be visionary. (Laughter.)

Dr. Charles D. Thomas: I would like to add my testimony to the gentleman's statement also.

Dr. Minney: Now, since we don't know, let us be careful. We have never had any trouble with hemorrhage and I never knew anybody to die from removal of the tonsils. Lack of dexterity on my part prevents me cutting the tonsil out with a knife. Now, I know other men can do it. I would trust Dr. Andrews and probably the other gentleman there, but I

Dr. Andrews: I never do it.

Dr. Minney: You do not do it?

Dr. Andrews: No, sir.

Dr. Minney: Thank you, then I will trust the other doctor.

Dr. Thomas: I don't do it either.

Dr. Minney: In case of a true hypertrophy of the tonsil remove it. Applications to it are useless. You need have no hesitancy, no fear, doctor, and I think the ordinary doctor may go on using the tonsillotome. However, in the cases that the doctor has mentioned here and shown us, those tonsils should have been removed entirely. Respecting the application to the tonsil or the injecting in it, etc., The application of a solution of cocain will deaden it, the tonsil is not very sensitive as a rule—of course, sometimes in inflammatory troubles they are, but put a little cocain on it and remove it. It is the exception that we put the patient in the hospital. As to the hemorrhage, I think it does them good. I have never seen any severe hemorrhage resulting. Once or twice I have been unnecessarily frightened. If oozing from the cut surface is too free, swab the surface with Monsel's solution. Personally, I do not know of a death resulting from tonsilar hemorrhage.

Dr. F. E. V. Shore (closing): I shall commence with the rear end of this discussion and proceed up.

Now, there have been remarks from Dr. Leipziger that he never knew of a fatal case of hemorrhage. I know of a fatal case of hemorrhage from the use of the tonsillotome in the hands of a general practitioner, but I do not consider that it is chargeable to that physician in any way whatever. It seems to me the use of the tonsillotome is the most unscientific procedure that is adopted in the entire line of surgery on the human anatomy. It can in no way be regulated, the amount of tissue that is removed cannot be determined and there is a possibility of injuring the surrounding structures. I have been, as I said, doing tonsillectomies for two or three years and I have never had anything approaching a fatal result. With the approximation of the

pillars the hemorrhage is practically nil. You have got absolute control over your hemorrhage when you approximate those pillars. It is as if you close up a wound and have the edges of the vessels strongly compressed.

Now, the doctor has mentioned that this tonsil was spoken of as if it were the principal cause of middle ear trouble. I am ready to confirm that statement. *It is* the principal cause of middle-ear troubles, at least it is the principal avenue of infection for the middle ear. Not only that, but the specialists outside of our own line will admit that it is the cause of endometritis and pericarditis and conditions at a further distance than that.

So far as the injection of adrenalin in the tonsil arresting hemorrhage is concerned I am free to say that I do not believe it will. But in my description of that operation I gently made traction on the tonsil and injected the adrenalin close externally to the tonsil and it is the usual thing to have no hemorrhage during the tonsillectomy, or at least only a very trifling amount. Now, that is not true with the use of the cocain when you do not use the adrenalin, you sometimes have a great deal of hemorrhage and you cannot remove the tonsil as readily under cocain as you can under adrenalin, because the patient is nervous, fretful and tossing about. I fail to see why any other instrument than a knife should be employed in the removal of a gland or a tumor in any other part of the body, or in this part, when you can have it entirely under your observation. You can see every move you make and you can see the capsule of that tonsil during the entire operation. I fail to see why there is any more danger in taking that out than in taking a tumor from any other part of the body. You are not going to injure a vessel if you keep your knife closely approximated to that tonsil, and I don't care how deep it is or how large.

Dr. Andrews mentioned the atrophied tonsil. Now, the majority of our tonsillectomies are on patients who have had tonsillotomies performed. They are on patients who have atrophied tonsils, they are on patients who possibly have normal atrophied tonsils, and these are keeping the pillars in an inflamed condition, and as Dr. Andrews called attention to, they require to be removed just as much as if the tonsil were filling the entire fossa up. With this close dissection I fail to see the necessity for punches, I fail to see the necessity for punches, I fail to see the necessity for usage of the snare and I don't see why the snare should be used in this operation any more than we would use it on the appendix when it has been freed from its adhesions, and I don't believe any general surgeon would consider that for one moment. The application of the snare for the removal of the appendix after the adhesions have been removed of course I concede might arrest the hemorrhage somewhat. With one doctor who spoke, I was very much surprised in visiting the eastern hospitals this summer to find the crude manner in which these tonsillotomies were performed.

"FRACTURES."*

C. B. FRY, M. D., MATTOON, ILL.
District Surgeon I. C. Railway.

I do not intend to deliver a dissertation upon the well-worn subject of fractures. I propose to briefly emphasize those points which I consider most important in the treatment of these injuries.

The management of fractures constitutes one of the commonest duties of the surgeon, hence the consideration of all that relates to their nature and treatment is of the utmost importance. It is especially so when we remember that a large majority of suits for malpractice are based upon the treatment of fractures and dislocations. It should be borne in mind that no matter what the character of the fracture, or its location, or the difficulties under which the surgeon labors, as to the environment of the patient, the lack of necessary implements, materials, etc., the patient expects

*Read at the first annual meeting Joint Association of Railway Surgeons of the I. C., Y. & M. V., and I. S. Railroads, Memphis, Tenn., February 27, 28, 1908.

that the parts shall be restored to their former normal condition and will be satisfied with nothing else.

The worst forms of fractures are occasioned by direct, external violence. The shape of some bones disposes them to fracture; a long bone is necessarily more readily broken than a short one; hence fractures of the tibia and femur, radius, ulna and humerus, are most common. Sex indirectly influences the liability to fracture, men being more frequently exposed to the causes of this injury than women. Age exercises a considerable influence, not only on the general occurrence of fractures, but also upon certain bones. Though fractures may occur at any time in life, yet bone being elastic in early life, is less liable to be broken than when it has become earthy and brittle in advanced life. In young persons the bone is usually broken transversely, while in more advanced age fractures are more commonly oblique and often comminuted. Fractures of the neck of the femur are especially common in old people; those of the clavicle in the young, while in middle-aged women, fracture of the lower end of the radius, is extremely frequent.

The special signs of fracture are deformity of the part, mobility in its continuity and crepitus. In the examination of a patient, it is always wise to compare the corresponding parts of bone on opposite sides of the body, and their relative situation to some fixed, neighboring prominence. There are two forms of injury that may be mistaken for fracture, a severe contusion or a dislocation. In the former, it is often impossible to determine the nature of the case until the subsidence of the swellin

It is usually possible to distinguish dislocation from fracture near a joint, by the impaired mobility, the bones being more or less fixed in their new position. I need not point out to you the necessity of determining, at the earliest moment, whether fracture or dislocation exists, for in the latter, prompt reduction would be indicated, and in the former, the lapse of time before the nature of the case is determined, might place it beyond remedy. Crepitation may be recognized in most cases of fracture and where present, it cannot mislead; but in some instances, a sound resembling crep itus is produced by emphysema, or the rubbin of tendons in their sheaths. Often needless suffering to the patient and injury to the soft parts, are inflicted in an attempt to produce crepitus. As to the x-ray in the diagnosis of fractures, it should be used when it is convenient to do so, but I consider it one of the least important of the means of diagnosis which we have. In looking at a fracture through a fluoroscope, we do not see the fracture, but a reflection of it. Similarly in a skiagraph we see the reflection of the fracture magnified relatively to the distance between the fracture and the sensitized place. To get a perfect result, it is necessary that the operator should be a master of his machine; that he should be an expert photographer, and that he should place the fracture in the most favorable position i relation to the plate. This combination is rare, At a meeting of a surgical society recently, a paper was read upon the use of the x-ray in the diagnosis of fractures, and the writer declared that it was little less than criminal for any one to treat a fracture without first submitting it to the x-ray. In the discussion which followed, a gentleman produced 3 skiagraphs of the same fracture of the femur, taken upon the same occasion, showing conditions so different that one could hardly believe they were from the same case.

The treatment of fractures presents three indications—the reduction of fragments to their normal positions, their maintenance in this position until consolidation is effected, and the counteracting of unfavorable constitutional symptoms and complications. It would be a waste of time for me to attempt to tell you of the best means to effect these purposes. The reduction of a fracture is a purely mechanical operation. Its retention in the normal condition depends upon the choice of apparatus and the skill in applying it. The great mass of apparatus recommended by different writers bespeaks alike the great facility with which some fractures are treated, and the insuperable difficulties presented by others. In all cases the fractures should be examined from time to time to see that coaptation is not disturbed, and especially before the period ordinarily required for union has elapsed. As is well-known, most

persons who receive an injury, no matter how slight, conceive the idea that they must have immediate surgical attention. They will go from the office of one surgeon to another with the most trivial wound and before setting out. will usually apply a quid of tobacco, some axle grease, a wad of spider web, or some turpentine,—whichever is most readily at hand—in order that no time shall be lost in the cure of the injury. While it may be stated that repair in a fracture commences immediately after its receipt, there is no essential necessity for its immediate reduction and treatment, especially if no great degree of deformity is manifest. If the soft parts have been badly contused and are largely swollen, it is much better to wait until it is possible to determine the exact conditions. As good results may be secured 24 hours or more after the injury as though the reduction and dressing were immediate. In the reduction of incomplete fractures, considerable difficulty may be experienced. If, as in incomplete fracture of the radius and ulna in young children, the deformity is great, the fracture should be rendered complete in order that it may be perfectly reduced.

I intend to speak specifically of but two forms of fracture, those of the tibia and fibula, and of the femur, and as the cases of fracture of the tibia which we, as railway surgeons, are called upon to treat, are usually compound, I will limit my remarks to that form.

Fracture of the tibia is extremely common. I think that at least 15 per cent of all fractures are of this bone. In the treatment of compound fractures, the results are in a great measure due to the care which is exercised in the first dressing. When the fracture is compound and is made so by the protrusion of bone, it is usually the upper fragment which protrudes. Often the puncture in the skin is small, and the protruding fragment denuded of periosteum is grasped tightly. Sometimes when there is little comminution of the bone the surgeon thoughtlessly pulls the projecting point under the skin and reduces the fracture without any antiseptic precaution whatever. It is needless to say that this is bad practice.

Before any attempt at reduction is made, the limb should be carefully shaved, scrubbed with soap and brush, and douched with some suitable antiseptic. The protruding point of bone should then be sawn off even with the skin. When the soft parts are extensively lacerated and the bone badly comminuted, the greatest care should be exercised in removing all foreign bodies, such as fragments of clothing, particles of cinders and grease, particles of detached, or margins of loose skin, and all fragments of bone, which are denuded of periosteum and lie loose in the tissues. Considerable judgment is required in determining what pieces of bone to remove and what to leave, some though split away from the bone, are still connected with it by periosteum throughout their whole length. These in young and healthy subjects, should not be touched, but in the old it is prudent to remove them; others are completely torn away and lie loose among the tissues, these should all be removed whether they carry the periosteum with them or not. If there is hemorrhage, it is to be treated on the same principle as in other wounds. It is best to cut away any projecting fragments of lacerated muscle or tendon.

Cases of the kind I have been discussing, commonly occur remote from hospitals. Where the lacerations are extensive, they are frequently ground full of axle grease, cinders and the like, which with them carry their quota of bacteria. The purest, sterilized water, at the temperature at which it can be used, is inefficient in rendering such a wound aseptic. It should be thoroughly irrigated with some chemical germicide, and my favorite for this purpose is the solution of formic aldehyd gas, called formalin. This you know is a 40 per cent aqueous solution of the gas. I have been informed by agents of physician's supply houses that most of the surgeons who have begun the use of formaldehyd, have abandoned it for one reason or another, and as I am an enthusiast upon the subject, if there are any of the number present, I hope that I may induce them to try it again. I use it in the strength of ½ of 1 per cent of formalin. Even in this strength its application to an abraded surface is somewhat painful at first, but I have never known any injurious effects to follow its frequent use. Much stronger solutions fix and

harden the tissues and prolonged use in very strong solutions would destroy them. With the solution of the strength I have mentioned, I try to irrigate, very thoroughly, every pocket and open space. The wound is then ready for drainage and suturing. I think it unwise to allow a drain to remain more than 24 hours in most cases. Unless the wound is so extensive as to make its use impracticable, I apply a plaster-of-Paris dressing with a suitable fenestrum. When this is impracticable, the Levis metallic posterior tibia splint makes a good support for the limb.

The remarks which I have made in relation to the securing of strict asepsis in compound fractures of the leg, apply with equal force to fractures of the thigh.

I consider a comminuted fracture of the femur, especially if it be compound, one of the most serious injuries which the surgeon is called upon to treat. In speaking of this injury, I refer particularly to its treatment outside of a well-regulated hospital. In the treatment of this injury, the greatest difficulty is experienced in maintaining perfect extension and counter extension. It is next to an impossibility to do this with the patient lying on a feather bed, or so-called "tick" of any sort. He should be placed upon a hard mattress, and an unyielding bed. The floor is an admirable place for the mattress.

There has been no marked advancement in the treatment of fractures during my professional life. The old Day splints which were commonly used when I was a young man, while more clumsy and inflexible, were just as efficient as the more elegant metallic splints of today. You are all familiar with the many forms of suspension apparatus used in the treatment of fractures of the femur, and these have some admirable qualities, the Hodgen apparatus being perhaps the best, but in my experience and observation, cases are so treated with varying success. The common practice of elevating the foot of the bed, fastening a rope to the ankle, running this over a pulley fastened to the foot of the bedstead from which weights are suspended, and using the body as a means of counter-extension, is unsatisfactory. I do not remember of seeing a case so treated that did not result in unnecessary shortening and usually lateral deformity. I know of but one appliance which fulfills all of the requirements in the treatment of this injury, and that is the long extension splint, commonly called Liston's.

I keep in my office at all times, strips of pine, ½ inch in thickness, 3 inches broad and 6 feet long, from which I make the splint to suit the case; boring holes at proper points, for the insertion of a band to go around the chest, and for the perineal band, and notches in the other end of the splint from which the extension is made.

With such a splint well padded, extending from the axilla to a point 6 or 8 inches below the foot, with a fixed perineal band for counter-extension, and a loop made under the heel from strips of adhesive plaster, carried well up the leg from which extension is made—with such a splint properly applied and undisturbed until union is effected—shortening of the limb to any marked extent, is a manifest impossibility.

But there are great objections to its use, as there are with all others with which I am acquainted. The pressure of the perineal band becomes almost unbearable at times, and this is liable to produce ulcerations in the groin. I cover it with oiled silk. Unless the malleoli are carefully padded, pressure of the adhesive straps is liable to produce ulcerations at one or the other of these points. Confinement to the dorsal position for so long a time, is another objection, but taken all in all, especially in young subjects, the results are better than in the use of any other appliance I have ever tried.

The fixed position of the limb for so long a time as is necessary to secure firm bony union results in adhesions of the muscles and their sheaths to the callus, or of the ligaments surrounding an articulation, especially those of the knee, and often a long time elapses before the mobility of the limb is entirely restored.

It may be said that the simplest fracture of the thigh is good for 3 months' disability, and this is often extended into twice or three times the period I have mentioned. Patients become discouraged by such long delay, and fearing

permanent disability, will seek an attorney—or as is more common, will be sought by one—and enter suit for damages. It is the duty of the surgeon in all cases of fracture of the thigh to inform the patient that his injury is a serious one, and warn him that his disability may be prolonged to months.

TRAUMATISM OF VARICOSE VEINS.*

A. J. ALCORN, M. D., CHICAGO.

Varicose veins are hereditary defects in which the vein walls are widened, rendering their few valves incompetent. Park makes this distinction between *varicose* and *dilated* veins:

"In varicose veins the valves are incompetent, the walls irregularly thinned, lengthened and tortuous." "In dilated veins the valves are competent and the walls are more or less thickened. Varicocele is a condition of dilated veins."

This paper has to do with the varicosities of the extremities, these being the veins most subject to traumatization. Although they are of hereditary origin, occupation of men requiring long hours in the erect position, or subjected to great heat or suffer frequent injuries predispose to conditions requiring the attention of the surgeon.

Varicosities are usually already manifest in early life, at the time when young men are selecting their occupations. The overfilled veins produce a full heavy sensation in the limb and becoming fatigued are accompanied by an aching fulness which divide the sufferer's attention between the employment and the misery he must endure. Because of this mental distraction, subjects of varicose veins are more liable to accidental injuries than those whose veins are normal. The period of recovery from traumatisms of varicosed regions is longer and less certain, with greater dangers than from similar traumatisms upon healthy limbs. Because of the psychologic distraction and consequent liability to injuries, and the tedious recovery, men with varicose veins should not be employed where there is great liability to injury or great responsibility depending upon them.

Several conditions arise from trauma to varicose veins. Pressure or a blow upon a vein may start a phlebitis that runs a painful course.

Thrombosis may arise from a contusion, pressure, puncture, rupture, a phlebitis, or infection. The thrombus may break up into emboli to produce profoundly alarming symptoms in other parts of the body; or, the thrombus becoming infected may produce a fatal pyemia. Hemorrhage of alarming profusion may result from puncture, incision or contusion causing rupture of a varicose vein. A slight scratch, abrasion, or contusion which devitalizes may slough and produce an ulcer sometimes succeeded by a septicemia. Ulceration may arise from the bursting of a vein, a phlebolith, a contusion or abrasion, or a simple scratch by the finger nails in relieving the eczematous itch.

Treatment of these traumatic conditions presupposes a chronic pathologic condition upon which the traumatism is superimposed. The poor return circulation and the masses of connective tissue and induration lessen the arterial and lymphatic circulation, so that instead of the tendency of an injury to recover, the tendency is here to get worse and worse. The nutrition of the part is so slight and the removal of wastes so sluggish that healing may be not only impossible, but degeneration of tissue inevitable. Traumatism frequently means devitalization of tissue, which must be removed before healing can take place.

Treatment is (1) hygienic, (2) pastural, (3) local, and (4) operative.

1. The patient often must be put into better physical condition. Constipation must be overcome. Good nourishing, nonstimulating food in moderate amount, with good light and air will often do as much in preventing complications from traumatic conditions as in recovery from them. Autointoxication is always a barrier to wound resolution and should receive attention in these conditions.

2. The patient usually, if not in all cases, should be in the recumbent position with the foot of the bed raised 6 to 10 inches from the floor. This is the position which all sufferers of dilated sapheni should assume during sleep-

*Read at fifteenth annual meeting C. M. & St. P. Railway Surgical Association, Chicago, December 5, 6, 1907.

ing hours. The venous congestion is relieved and the arterial and lymphatic circulation greatly improved. If the trauma does not actually require a recumbent position, it will do the veins enough good to justify thus confining the patient during the healing of the traumatism.

3. The local treatment should be as free from irritation as possible, both physical and chemical. No massage is ever indicated in these conditions. The limb should be kept absolutely quiet until complete recovery has been attained. All bandaging should be done so there will be no constricting of the limb.

In the use of antiseptics great caution and careful judgment should be exercised. Antiseptics are usually needed. The mildest antiseptic compatible with the severity of the infection should be the one employed. If no infection is present no antiseptic is needed, and the wound should be treated upon aseptic principles. If the infection is severe, an efficient antiseptic should be employed and abandoned as soon as a milder antiseptic will accomplish the need, remembering that a disinfectant will destroy human cells as well as bacteria.

In phlebitis a non-irritating anodyne liniment may be applied until the inflammation ceases. If a thrombus forms and there is no open wound, the same treatment will apply.

If there is a penetrating wound and hemorrhage to be checked, a moist antiseptic or aseptic tampon should be bound firmly enough to control hemorrhage. If a spontaneous rupture occurs a sterile tampon should be applied. If the hemorrhage is subcutaneous, rest in the elevated position is usually all that is necessary, although if gangrene threatens the extravasated blood should be set free through a cutaneous incision adjacent to the threatened area.

In the case of a scratch or an abrasion of any kind the abrading instrument or clothing will certainly infect, and the rough, irregular edges make a favored haven for bacteria. Here brush, soap and warm waters should be employed, then irrigated with antiseptic solution and a sterile dressing applied—depending upon the original cleansing for the removal of the infection.

When an ulcer has formed, make a thorough original surgical cleansing, and trim away any necrotic material and dress once with an antiseptic of efficient strength, and subsequently dress with a mild antiseptic. The bacteria is not destroyed will destroy granulations, so it is best to risk the sacrifice of some cells in the original dressing in order to destroy the bacteria that may be reached.

Acetozone solution, 3 to 5 gr to the quart, rejecting the sediment, makes a very efficient first dressing, and ichthyol in 20 to 50 per cent ointment subsequently. Ichthyol is especially valuable where there is gangrenous material to be separated. After the surface is clean and covered with healthy granulations it may be covered with a mild powder, zinc oxide or campho-phenique serving the purpose. If the ulcertaion is very indolent, the method of irrigating with a stream of hot water may be used. Levings recommends irrigations with hot carbolized water, and compresses of the solution bound on and covered by oiled silk.

Royce recently recommended a method of caring for the limb and ulcer during healing. It consists of the application of Unna's paste, and the bandage applied, without reversing, evenly over the leg—the ulcer covered by a mild powder and several layers of sterile gauze and over this the bandage.

4. Operative treatment scarcely comes within the province of this paper. If a thrombus undergoes suppuration, it is treated as an ordinary abscess, with special care to avoid infection. Skin grafting is sometimes performed in complicated traumatism of varicose veins, and sometimes connective tissue masses require excision before healing will result—and, rarely, amputation is necessary.

DISCUSSION.

Dr. T. N. Bogart, Elcelsior Springs, Mo.: This paper has been of considerable interest to me, not that I have had any vast amount of experience with varicose veins, but one particular case made such a strong impression on my mind that it caused the subject to be of more interest to me.

The case occurred about ten years ago, and was a varicose condition of internal saphe-

nous vein just below Poupart's ligament. It became extremely large. On the 9th of February this individual, while on the water was severely injured—injured so badly that as a result of the injury the internal saphenous vein seemed to be filled with blood until perfectly solid. The limb became edematous and badly swollen, and from the 9th to the 21st of February the patient, in London at that time, was in bed most of the time, anxious to get back to the United States. While there he consulted a number of leading physicians of that city to get their idea as to what method of procedure to take. The patient was opposed to operation if he could possibly get along without. Among the physicians was a noted surgeon who had charge of the surgical work of the British army during the war with the Boers. There were 6 surgeons altogether who said that the only thing to do was to operate and let the blood out of the vein, because on the way across the ocean the chances were that a thrombus would be formed and the patient die.

However, the patient took a long chance, came to New York, and consulted a number of physicians there, 38 out of 42 advising operation. Among the number who said not to operate, but to leave it alone, that it would be absorbed and the vein become obliterated, the injury thus resulting in a cure instead of the limb being as bad as before, was Dr. Carl Beck of New York. The patient had faith in his opinion, because it was what he wanted to hear. The result was that the patient went on crutches for about three months and was completely cured, the vein seemed to be entirely obliterated. Therefore the injury was the cause of cure in that case. The question is, was it necessary to operate on that patient for the purpose of producing a rapid cure, or is it best under those circumstances not to operate, but allow absorption to take place and cure it in that way?

PRACTICAL HINTS IN EYE INJURIES.

Pfalz says that in burning of the lids the general surgical measures are usually sufficient to remedy the condition; if there is a loss of substance, it should not be left to spontaneous healing but the eschar should be curetted off and strips of skin, from the inner side of the arm should be placed upon it. In burning of the eye ball through explosion one often finds a superficial crust on the cornea which can easily be removed. The scab usually consists of worn-out epithelial layers and reforms very quickly. To alleviate the pain he gives 1 per cent of airol ointment .01 per cent holocain (not cocain which macerates the epithelium). Granules of powder should only be removed if they are located superficially. An encapsulated granule does not influence the vision but a scar on account of its property to scatter light may influence the vision very markedly. Erosion from lime should be freely irrigated with water. In every contusion of the eye one should suspect dislocation of the retina and injuries to the blood vessels, and a careful examination of the vision should be made. The author warns against the too free use of atropin, as often pupillary tears become more gaping by its use. His therapeutics consist of pressure, rest and the ice bag.—*Military Surgeon.*

NEW DANGER SIGNALS.

New rules that have just gone into effect on the New York Central abolish red as a danger signal and establish a new system of color signaling as follows:

Danger stop—White flag or light, formerly red.

Caution, slow down—Yellow flag or light; formerly white.

Branch or cross-over—Red; formerly purple or green.

Dwarf signal used on reverse movement over switches—Purple, as heretofore.

When car repairers are at work beneath a car, a blue flag or light will be shown, indicating that the car must not be moved.—*Ex.*

Much caution should be exercised before making a diagnosis upon *history* alone. Physical signs of disease which the surgeon himself can observe, are as a rule, more important than mere history, for which he has to depend upon what is told him by others. If history and physical examination appear to be contradictory, more stress should, as a rule, be laid upon the latter than the former.—*Berry.*

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Subscribers not receiving their Journal regularly will confer a favor by reporting the non-receipt to the editor.

ANNUAL MEETING.

The fifth annual meeting of the American Association of Railway Surgeons will be held in Chicago, October 14, 15 and 16, 1908.

LISTS OF MEMBERS.

The list of names and addresses of the membership of the American Association of Railway Surgeons agreed on at the last annual meeting has been mailed. Any member failing to receive his copy will be furnished with another one by notifying the editor.

DEATH OF DR. GRIFFITH.

We regret to record the sudden death of Dr. G. W. Griffith, of Louisville, Ky., chief surgeon of the Louisville & Nashville railroad, and one of the executive members of the American Association of Railway Surgeons. From the obituary, published elsewhere, it will be seen the doctor occupied many positions of trust in his community.

WANTED AN EXPERT.

The following advertisement appeared in a recent number of the Chicago *Tribune:*

PERSONAL—Wanted—At once, name of railway engineer or ex-engineer who would be willing to testify as an expert for plaintiff in personal injury suit; satisfactory compensation. Address XX, *Tribune.*

"THE AMPUTATION BULLETIN."

We learn from the *Publisher's Weekly* that the so-called "ambulance chasers" are to have a journal of their own with the above title. The price of subscription is to be rather high—$50 per year, yet, as our authority remarks, will be trifling in comparison with the benefits to be derived. According to the prospectus, these will be as follows:

"We cover the United States on amputation information, from which any good, live lawyer can surely get twenty-five or fifty cases a year—each case with a value of $5,000 to $25,000—and, as these cases are taken on a basis of 50 per cent, the income an attorney can obtain from this information is far greater than the salary of the President of the United States."

Translations

SARCOMA AND TRAUMA.

OSKAR ORTH, M. D.
(Translated for THE RAILWAY SURGICAL JOURNAL.)

The relation existing between trauma and tumor formation has only been recognized of late years. The recent agitation of the subject can be attributed in part to the results observed after accidents, and in part to the same relation observed in tuberculosis. In fact, most of the establishment of the theory of the relation between trauma and tumor formation is due to observations on cases of tuberculosis developing after some trauma. For instance, it has been observed that in tuberculous patients a slight injury would develop tuberculous lesions in the area injured.

The hypothesis—one supported more by *a priori* reasoning than by scientific deductions—being that the tumor cells are called into activity by the external exciting cause. This theory seems corroborated by two cases, a description of which follows:

A man of 46, always in good health, sustained a contusion of the left testis about four years ago, without any untoward consequences at the time. About a year later a swelling developed, which in the course of four or five months reached the size of a small child's head. There was little pain or inconvenience; however, on account of the rapid growth of the tumor it was extirpated, together with the inguinal glands. Microscopic examination of the excised growth showed honeycomb-like masses of large, round cells separated by layers of connective tissue of varying thickness. The growth was very vascular, and on this account a diagnosis of angiosarcoma was made. The patient was discharged on the 14th day. For a year he was able to pursue his avocation. At the end of that time he again presented himself with a recurrence of the tumor. A mass presented, extending from the right testis over the whole scrotum. The operation scar appeared but little infiltrated. Above Poupart's ligament on the left was a metastatic growth the size of a goose egg. Realizing the hopelessness of further operative treatment, x-ray treatment was begun, owing to the severe pain experienced while at work. The effect of the treatment was somewhat analgesic, the size of the growth was reduced in a small but perceptible degree. The patient was then lost from observation.

Case 2. A 14-year-old girl, whose grandfather is supposed to have died from carcinoma of the upper jaw, had a premolar tooth extracted from the left side of the lower jaw 3 years before presenting herself. During the extraction the crown of the tooth was broken off, and the dentist was obliged to extract the roots piecemeal. The result was a case of periostitis with abscess formation. A phlegmon developed in about 5 months' time, which was treated with warm compresses without effect. The phlegmon increased and finally a tumor became manifest; this was excised. The tumor returned in the scar in scarcely 6 months' time.

I decided upon resection of the alveolar process of the jaw, and during the operation discovered a central osteo-sarcoma, such as is seen in the epiphyses of the long bones of the extremities. Microscopic examination showed the tumor to be a giant-cell sarcoma.

While the origin of both these tumors is somewhat obscure, it should be pointed out that in both there was a history of antecedent trauma. Moreover, in the last case there was another etiologic factor—hereditary carcinoma. As already observed, we can in tuberculosis—as well as in sarcoma—trace a relationship between the lesion and local trauma. Senftleben (*Archiv fur klinische Chirurgie* Bd. I) has especially emphasized trauma as a cause of the central osteo-sarcomata. He states unqualifiedly that in every case some traumatic influence could be shown, the tumor developing rapidly after the trauma, usually within a few months, and attended by great pain. In other cases the tumors after a certain period developed more slowly or remained stationary. Patients—especially where a suit for damages is in contemplation—readily admit the occurrence

of a past trauma, but neither of my cases were promoted by such considerations.

It is evident that while in the case of the man but a single trauma was followed by tumor formation, in the last case there were several in succession. The cases reported seem of interest, first, since by an early diagnosis the operative results would be more favorable. In the next place Case 2 seems to corroborate the opinions of those authors who believe that an irritating factor of relatively great intensity applied in quick succession, will—even in normal cells—lead to failure of restorative power.—*Munchener medizinische Wochenschrift.*

TOTAL DISLOCATION OF ONE-HALF OF THE PELVIS.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

Luxations of the pelvis are of very rare occurrence, and each case is worthy of being recorded.

The one reported recently by Creite of Gottingen concerned a man aged 38, who fell off a wagon. In his fall he was caught on a large hook attached to the shaft and hung for some time suspended by the perineum, finally falling to the ground on his left side. On his entrance to the hospital a large perineal wound was found reaching from the scrotum to the anus, and extending on the right deep into the cellular tissue of the true pelvis. Through this wound the symphysis of the pubis could be felt gaping widely. The region over the sacro-iliac synchondrosis was so swollen by extravasation that palpation was impossible. The right leg was not paralyzed and in slight external rotation; all movements of the leg were painful, especially at the synchondrosis. The rectum, bladder and ureter were intact.

The wound was carefully disinfected, but delirium tremens developed, then the wound became infected and the patient died on the sixth day of septicemia.

At the necropsy an enormous phlegmonous infiltration was found involving the pelvis and the upper thigh. The symphysis pubis was separated 1½ inches; the bones making up the sacro-iliac synchondrosis were also separated through their whole extent to a distance of about 1·5 inch; the right half of the pelvis was slightly movable.

The case is of additional interest, since it is the first in which the violence was exerted from the inner side of the iliac bone, all other reported cases being crushing injuries acting on the exterior of the pelvic girdle.—*Zeitschrift für Chirurgie.*

There are three chief types of protrusion in *femoral hernia.* In the first there is a rounded, and later distinctly globular, swelling, lying below the inner end of the groove formed by Poupart's ligament. (2) The hernia after it has passed the confines of the femoral canal, tends to descend the thigh, and gives rise in the upright posture to a somewhat overhanging mass. In the third there is a reverse of this, for the hernia mounts up in front of Poupart's ligament, obscuring as it were its inner half. Such cases are not nearly as common as is generally supposed; but when present they may give rise to considerable uncertainty as to whether an incomplete inguinal or a femoral protrusion exists, and this is especially so in the case of women.

Another form of this third variety of femoral hernia is the one which passes up and out toward the anterior superior spine, thus acquiring an oblique direction, which is again liable to be confused with that of an inguinal hernia.—*Eccles.*

The indications for operation in the case of patients suffering from some *complicating disease* vary according to the seriousness of the condition which the operation is designed to relieve. On the one hand, affections which imminently threaten life will be operated on whatever associated disease may be present, unless the patient is moribund; and, on the other hand, one will hesitate to operate for the relief of some cosmetic disability if the patient has some affection which increases the risk. Between these two extremes there are a whole series of conditions, each of which must be judged on its merits.—*Schlesinger.*

Extracts and Abstracts.

CASE OF TRAUMATIC CHYLOUS ASCITES.

WILLIAM E. MORGAN, M. D., CHICAGO.

While returning from an errand a boy was run over by a wide-tired wagon, the wheel or wheels passing horizontally across his abdomen just below the costal margins. The immediate shock was severe and accompanied by all the usual symptoms of contusion of the abdominal contents, but without the extreme evidences of ruptured viscera or great internal hemorrhage. The parents refusing consent to immediate operation, the child was put to rest with mild opiates, all nourishment prohibited, and expectant measures adopted. Distressing vomiting persisted for forty-eight hours, the abdominal walls throughout were held in rigidity, and oppressive muscular response, due to right sided tenderness.

From the symptoms and findings I concluded there had been severe contusion to the liver and other indefinite abdominal viscera, and as the boy was making marked improvement I advised a continuation of the expectant methods. Soon after this visit the parents yielded to the appeals of the child for nourishment, and began to give water, then milk and broths, and finding no harmful results, gradually increased to soft diet, the child meanwhile increasing in strength, losing the pain, or rather distress, and making altogether favorable progress except in one regard, viz., a progressive ascitic condition which at the end of two weeks had become so great as to impede respiration and embarrass the heart.

Contrary to the findings in a closed portal obstruction the ascites was not accompanied by dilated and tortuous integumentary veins, but gradually diffused itself over the whole abdominal area and flanks and extended slightly into the skin of penis and scrotum, but not the thighs and legs. The pulse after the first forty-eight hours, though weak, was not markedly increased in frequency, the temperature rose only to 100° F., vomiting, which was never bloody, ceased, the bowels moved quite naturally, no blood in stools, and urine free from blood was voided without assistance.

When I first saw him on the second day after the injury there was moderate tenderness over the epigastrium and right hypochondrium, and although abdominal rigidity was quite noticeable, all of the abdomen could be examined without difficulty and without noticeable distress to the patient. The hepatic area was slightly reduced, there was no piano-percussion evidences of free fluid in the abdomen, no flatness in the flanks or lower abdominal areas, the splenic area was well and normally defined, stomach slightly dilated and a very slight tympanites existed over the rest of the abdomen. I was unable to make out the left kidney, but the right one could not be palpated owing to the rigidity of abdominal walls.

Tapping now became necessary and 2½ gallons of fluid were drawn off at the first sitting, very similar to that which I show you, and which proved to be chyle of the purest type. Careful microscopic examination failed to reveal even a red blood corpuscle, and although he has been tapped regularly at least once a week since that time, no blood has ever been found and no extraneous substances except a few peritoneal endothelia after contrifuging. Owing to the fact that the parents would not allow operation without a guarantee of cure, no operation has been attempted excepting the tapping. In lieu of the scientific value of an operation for closing the leak we have, however, a continuous fountain of physiologic information in the opportunity of obtaining at measured intervals human pure chyle, produced by an otherwise perfectly healthy individual, the subject being fed during these intervals on measured diet of definite chemical composition in each instance.

From what casual information I have been able to obtain, I believe this is the first and only case recovered of chylous ascites, without contamination by other secretions or excretions or admixture with returning lymph from the rest of the animal economy or with the products of disease such as we get in carcinoma, chylous cysts and the like.—*Illinois Medical Journal.*

Notices and Reviews.

"Diseases of the Breast, With Special Reference to Cancer." By William L. Rodman, M. D., LL. D., Professor of Surgery in the Medico-Chirurgical College of Philadelphia, etc., etc., With 69 Plates, of which 12 are printed in colors, and 42 Other Illustrations. Philadelphia: P. Blakiston's Son & Co. 1908. 8 vo., pp. 385. Cloth, $4.00 net.

The medical man who reads this work will be convinced that it was written by a master-hand. The book represents the results of Professor Rodman's experience and twenty-five years' study on this subject, and with his own views are also given the opinions of other well-known operators and investigators. The author is well qualified to write upon diseases of the breast, having been a student of Dr. S. W. Gross, who is recognized as a pioneer in breast surgery, and since his death Dr. Rodman has taken up the work where he left it off.

The book is divided into eighteen sections, devoted to the following subjects: Anatomy and Physiology; Inflammatory Diseases; Tuberculosis and Syphilis; Actinomycosis and Cysts; Diffuse Hypertrophy and Keloid. All these subjects have been given careful study, and have been accorded the space which their importance deserves. Tumors, and more especially carcinoma, naturally constitute the most important portion of the work, and together with the one on Paget's disease of the nipple, take up the remaining ten sections.

Carcinoma alone is given 200 of the 385 pages of the volume. Its pathology, symptoms, diagnosis, prognosis and treatment, are fully discussed, and a strong plea made for early and radical operative treatment. The most approved operative procedures are minutely described, and the relative value of each discussed. The operative technic is profusely illustrated by splendid plates,—the author's own procedure being illustrated by 10 full page plates taken by a special artist from the actual operation.

In fact, it is one of the best illustrated volumes which has come under our observation, and has the additional merit that the great majority of the illustrations are original. From every point of view it is a most welcome addition to the surgical library. J. R. H.

"Bier's Hyperemic Treatment in Surgery, Medicine and All the Specialties, a Manual of Its Practical Application." By Willy Meyer, M. D., Professor of Surgery at the New York Post-Graduate Medical School and Hospital; and Professor Dr. Victor Schmieden, Assistant to Professor Bier at Berlin University, Germany. Octavo, 209 pages, Illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co. 1908. Cloth, $3.00 net.

A timely and very pretty volume on a subject which has not received the attention it deserves by the rank and file. It will no doubt be news to many that the hyperemic treatment is applicable to and recommended for meningitis, diphtheria, pulmonary tuberculosis, lumbago and sea sickness, and useful in gynecology and obstetrics, in neurology and psychiatry and in dermatology.

"Fairly satisfactory results have been obtained by Bier" in acute articular rheumatism. It is doubtful, however, whether the general practitioner will wait a week for results in these cases as intimated by the following paragraph (p. 154):

"If the treatment alone does not relieve the symptoms within, say a week's time, salicylates should be given in addition, but in smaller doses than are usually administered in these cases. No harm has resulted from giving the salicylates at once."

The surgical affections amenable to the treatment are fully discussed, and the details of the technic and profusion of illustrations make the book very attractive and instructive. A large variety of suction cups, and various devices for inducing hyperemia by hot air are described in text and illustration. The application of the elastic ligature is so clearly set forth and its principle so carefully explained that these chapters alone will well repay the reader.

In the introduction we get a definition of inflammation and are told that according to Bier:

"It is a direct mistake if the physician orders the use of an ice-bag at the time of a beginning inflammation; by so doing he resists the healthy reaction of the body; he suppresses the salubrious effect of the inflammation and favors the deleterious influence of bacteria. The fact that the ice-bag often brings comfort to the patient and reduces the pain, at least temporarily, does not invalidate the truth of the above dictum any more than the fact that an

ice cold drink momentarily comforts a feverish patient."

The work is divided into two parts, General and Special, and certainly presents the subject in a most comprehensive and interesting manner from the stand-point of two enthusiastic devotees. H. A. L.

"The Operating Room and the Patient." By Russell S. Fowler, M. D., Professor of Surgery, Brooklyn Post-Graduate Medical School, Brooklyn, N. Y. Second Edition, Enlarged. Octavo, 284 pages, Fully Illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co. 1907. Cloth, $2.00 net.

This important work has been before the profession for more than two years, the preface to the first edition having been written January 1, 1906. The fact that an edition was used in so short a time speaks well for the value of the book.

The second edition is by no means a reprint of the old but is practically new. The author has added over 100 pages of very important matter relating to the after-treatment of surgical cases. While the first edition only contained a chapter of 17 pages on this subject, the new edition contains six chapters, comprising 159 pages. The first edition had come to be used largely in hospitals by both physicians and nurses, but the new edition will be much more valuable, as it deals with problems of after treatment in a way so much required in modern hospital training schools. The chapters on the "Course of Aseptic Wounds," "Infection," "Complications of Wound Infection," "Aseptic Wounds in Infected Tissues," "Wound Disturbances the Result of Pressure," "Wounds in Special Tissues," are very valuable. It is readily seen that the new edition is really a new work. Chapter VII, treating of the "Course of Aseptic Wounds" and comparing them with the course of healing "per Secundum," is very interesting and practical, and really contains the meat of the whole subject.

Every physician or nurse charged with the care of a surgical case, whether major or minor, will be greatly helped by reading Dr. Fowler's book. C. E. B.

"Surgical Diagnosis." By Daniel N. Eisendrath, M. D., Adjunct Professor of Surgery in the Medical Department of the University of Illinois (College of Physicians and Surgeons). Octavo, 775 pages, with 482 Original Illustrations, 15 in Colors. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co. 1907. Cloth, $6.50 net; Half Morocco, $8.00 net.

After going over this work with great care, the writer has nothing but praise for it. It is especially adapted for the needs of the busy and general practitioner, being especially strong in differential diagnosis.

Beginning with Affections of the Head, the subjects are discussed systematically and concisely in anatomic order, not with too great detail, but still fully and clearly enough, so the surgeon is materially assisted in making a diagnosis. The section on The Extremities cannot be otherwise than helpful in diagnosing the common, every-day affections met with by the general surgeon. The illustrations are exceptionally fine, clear and ample for the busy man, who desires to grasp the fundamentals without going into details.

In conclusion the writer warmly commends this book. When one is wearied by searching through ponderous text-books and lengthy articles, he will find actual refreshment in Eisendrath's "Surgical Diagnosis," because every one of its 775 pages contains some useful and practical knowledge. I. D. STEFFEN.

"Variations of the Bones of the Hands and Feet, a Clinical Atlas." By Thomas Dwight, M. D., LL. D., Parkman Professor of Anatomy at the Harvard Medical School. Philadelphia and London: J. B. Lippincott Company. 1907. Small Quarto, X and 25 pages, 36 Full Page Plates. Cloth, $5.00 net.

This work is of great importance to anyone having to deal with real or alleged accidents, or the results of the same, and especially so to x-ray workers.

Anatomists have known for many years that Professor Dwight has devoted himself to the study of variations, particularly those of the spinal column and of the bones of the hand and foot. In the present volume he has given the practical results of some of his researches in this direction.

The work consists of two parts—the text and the plates. The former is subordinate to the illus-

trations, yet contains a brief account of all the variations, which the use of the x-rays has shown to be much more frequent than formerly supposed.

Too much praise can not be given to the pictures, some 79 in all on 36 plates; many of them are life size, and those of the bones themselves are as clear as though one were looking at the actual specimens. The radiographs are equally satisfactory, moreover the value of the latter is enhanced in many cases by a photo of the extremity by the x-rays followed by one of the bones after maceration. Of especial interest in this connection is the account of the "Vesalianum," which is found in the 5th metatarsal and metacarpal bones, respectively. This may be mistaken for a fracture, as may most of the other varieties described and pictured.

This atlas has been prepared for the use of the practitioner. Some variations are discussed which are of interest to the orthopedist, but attention has been given chiefly to those which may be expected to appear in skiagraphs taken aften an injury and which may suggest a fracture to the unwary.

Well-compensated *heart disease* does not contraindicate operation when this is called for by some disability of importance. Intervention in the presence of defective compensation is always risky, but is not contraindicated when life is threatened, and in particular in operations undertaken to relieve circulatory embarrassment, evacuation of ascitic or pleuritic effusion, removal of large abdominal tumors and the like. Sometimes when valvular disease is well-compensated, a troublesome tachycardia follows operation, but this usually yields to the application of an ice-bag and to drugs, such as digitalis and strophanthus.—*Schlesinger.*

Diminution in the size of the tongue, apart from injury, is rarely seen except as the result of paralysis of a hypoglossal nerve. If this be unilateral, as it usually is, the tongue is not only greatly atrophied on the affected side, but when protruded it deviates to the same side. The diagnosis is that of affection of the hypoglossal.—*Berry.*

Personal

Dr. George W. Griffith died at his home in Louisville, on April 10, from cerebral hemorrhage after an illness of 24 hours. Dr. Griffith, who was 67 years old at the time of his death, was a graduate of the Long Island College Hospital, class of 1866.

He was a veteran of the Civil war and for many years Medical Director of the G. A. R. in his state, as well as examining surgeon for the U. S. Pension Bureau.

He was president of the Board of Aldermen for over ten years; member of the School Board, a member for 30 years and for 22 years Secretary of the Board of Trustees of the University of Louisville.

In addition to being chief surgeon of the Louisville & Nashville railroad, Dr. Griffith was also chief surgeon of the Louisville Street Railway Company, and of the Louisville Bridge and Iron Company, and attending surgeon to St. Mary's and St. Elizabeth's Hospitals, also president of the Jefferson County Board of Health.

ORGANIZATION OF PENNSYLVANIA RAILROAD SURGEONS.

Surgeons of the Pennsylvania Lines east of Pittsburg met at Harrisburg March 31, adopted a constitution and by-laws and elected the following officers: President, Dr. J. E. Egbert, Wayne; vice-presidents, Drs. B. F. Wagenseller, Sundbury, and Francis V. Ware, Millville, N. J.; secretary, Dr. William H. Cameron, Pittsburg; treasurer, Dr. Eugene H. James, Harrisburg; and executive committee, Drs. William B. Henderson, Phillipsburg; William McKenzie, Conshohocken, and Charles B. Wood, Monongahela.

The comparative *frequency of the sexes* for hernia is as follows: Males—inguinal, 96.33 per cent; femoral, 2.53 per cent; umbilical, 1.14 per cent. Females—inguinal, 50.6 per cent; femoral, 33.5 per cent; umbilical, 15.9 per cent.—*Eccles.*

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PUBLISHER'S DEPARTMENT

GOOD BUTTERMILK.

Of all the pure food scares that have been known, nothing could be more absurd than the "artificial buttermilk" excitement that is agitating Chicago. The health authorities there have discovered that dealers are selling artificial buttermilk instead of the ordinary product, and the newspapers are discussing the subject under scare headlines, referring to "pig feed" and other humble uses to which buttermilk may be put. They appear entirely oblivious of the fact that ordinary buttermilk is commonly and extensively used for pig feed, and that it is very excellent feed for pigs as well as for other animals, including human beings. And according to the highest authorities artificial buttermilk is more healthful than the ordinary article.

The reasons given for this are simple. Ordinary buttermilk is simply sour milk or cream with the butter fat removed. The removal of the butter fat makes it no more healthful, for butter was long ago scientifically demonstrated to be one of the most healthful of fats and oils. Milk sours on account of the addition of bacterial ferments, the essential one being lactic ferment, or, strictly speaking, the bacteria of lactic ferment. But in the ordinary process of souring, other bacteria commonly get into the milk that are not all beneficial. The chief of these are the bacteria of acetic ferment, which makes vinegar; those of mucic ferment, which make "ropy milk"; and those of butyric ferment, which make rancid butter. If these impurities get into the milk, they remain in the buttermilk after the butter has been removed.

This objectionable feature led to the making of buttermilk from pasteurized milk, from which all the bacteria have been removed, by adding the bacteria of lactic ferment, which are all that are needed to secure the pure buttermilk. The process was carefully worked out in the laboratories, and Prof. Elie Metchnikoff, the successor of Pasteur, is enthusiastic in his commendation of the artificial product, which contains none of the objectionable ferments. When unskimmed milk is used it also contains the healthful butter fat, and when skimmed milk is used it gives pure buttermilk of the ordinary kind. The common mode of adding the bacteria is in the form of "lactone tablets," which are specially prepared forms of the lactic acid ferment.

It is amusing to note that while the Chicago health authorities are rasing a great outcry against artificial buttermilk, Dr. Hurty, the secretary of the Indiana State Board of Health, makes it at his home and uses it at his table, pronouncing it far superior to the ordinary article. As is commonly known in Indiana, Dr. Hurty is an uncompromising advocate of pure food and a relentless foe of all obnoxious microbes. When he pronounces a food or drink desirable, objection to it on health grounds is hypercritical indeed.—Editorial in the *Indianapolis Star*, Nov. 30, 1907.

TWO CASES IN THE PRACTICE OF C. H. POWELL, A. M., M. D.

CATARRHAL ENDOCERVICITIS IN A YOUNG WOMAN.

A few weeks ago Miss Lizzie J., aged 20, consulted me for a vaginal discharge of an albuminoid consistency, soiling her clothes and excoriating the external genitals; so troublesome did this become she was compelled to wear a napkin continuously, not only for cleanliness, but to protect her person from the irritative discharge. Speculum examination revealed an endocervicitis; out of the cervix uteri considerable fluid was escaping. Treatment consisted in applying pure Glyco-Thymoline on a wool tampon and following the removal twelve hours later with Glyco-Thymoline douching, 2 tablespoonfuls to the quart. Perfect recovery resulted in ten days of this treatment alone.

PRURITUS VULVAE RESULTING FROM DIABETES.

Mrs. Susan G., an aged lady, the mother of seven children, consulted me Dec. 1, last, for an excessive pruritus about her external labia, necessitating the frequent use of whatever cooling lotions she could apply to assuage the intense itching. Urinalysis showed a sp. g. of 1.040, and decided reaction to glycosuria. Diet was prescribed and codein given in ½ grain doses with gold bromid and arsenious acid t. i. d. Glyco-Thymoline in full strength was applied to the vulva for the relief of the pruritus, the cessation of which was immediate and gratifying to the patient. The sugar is materially reduced in quantity, but she is still a diabetic. The incessant itching, however, under the Glyco-Thymoline application has disappeared and I do not believe will return.

INTERNAL MEDICATION IN GONORRHEA.

BY DR. JOSEPH PIKET.

Assistant at the Allgemeine Poliklinik, Vienna. (Berichte d. Versammlung Duet. Naturforscher u. Aerzte, September, 1907.)

The treatment of gonorrhea taxes all the therapeutic resources at our command, among which internal remedies by no means rank as the least important. Of the latter the balsams until lately held the dominant position. But in the large doses in which they have to be given they disturb the gastrointestinal tract and, by the excretion of resinous acids, irritate the kidneys, while normal renal function is indispensable in the internal treatment of gonorrhea. Occasionally, too, a balsamic erythema or urticaria is observed. As, moreover, the balsams are powerless to prevent the development of gonorrhea, it was most desirable to find a more effective adjuvant to or, under proper circumstances, substitute for the injection treatment.

These efforts have found successful culmination in arhovin. By reason of its strongly antiseptic components arhovin possesses a marked disinfectant action, which after its exhibition is still greater, as the remedy, *i. e.*, its decomposition products—renders the urine acid, clears and imparts bacterio-inhibitory properties to that excretion, and thus combats the pus cocci. Arhovin is not toxic, has no harmful effects on stomach or intestines, and does not irritate the kidneys. According to Burchard-Schlockow's work, it is absorbed in 20 to 25 minutes, and is excreted in altered form. The acidity of arhovin urine is so marked that usually it remains acid for 14 to 18 days. Piket's experience with it extends over two years and includes a large number of severe cases, both of acute and chronic gonorrhea, gonorrheal cystitis and complications in the female. He summarizes his opinion as follows:

"Arhovin is readily taken and well borne, has no deleterious effect of any kind, limits secretion, hinders gonococcal growth, and possesses a marked sedative action. It is a valuable addition to the armamentarium,—a remedy that no physician will want to dispense with, for a test leads to its permanent adoption."

CONTRIBUTIONS TO THE THERAPEUSIS OF CHOLELITHIASIS.

BY ARTHUR SCHWEITZER.

Port and School Physician, Fiume.

A survey of current medical literature leads to the gratifying conclusion that important progress has been made both in regard to the etiology and treatment of cholelithiasis. It is now established that it is due to catarrh of the gall-bladder and ducts, occasioning deposits of lime and cholesterin. Biliary stasis hinders expulsion of concretions and of micro-organic accumulations; the disease occurs in 20.6 per cent of females, who wear corsets, and only in 4.4 per cent of males.

Carlsbad waters, as Naunyn and others have shown, act by stimulating the circulation and increasing the powers of resorption, and by favorably influencing the hepatic and gastro-intestinal mucosæ. But even the warmest advocates of Carlsbad admit that radical cure can only be expected from drinking the waters at the springs, whereas many sufferers are unable to leave home.

Salicylic acid produces an abundant flow of thin bile and has important antispastic and antiseptic effects. It has no direct solvent action, but does prevent the formation of new stones. The employment of olive oil, though often followed by excellent results, is extremely difficult, on account of the uncontrollable nausea it occasions. Blum therefore advocated the non-irritating saponaceous combination, the oleate of soda, which in addition to the cholagog action of the oil, has marked cholesterin-solvent effect.

The favorable results which Brings and others obtained from probilin pills, in which Bauermeister effected a happy combination of salicylic acid and sodium oleate, induced Schweitzer to try the remedy in his own practice, in seven cases, of which he details three. The attacks diminished in number and intensity even in the first days of the probilin treatment; and after its termination the patients remained well for considerable periods of time. It is well to employ the pills also as a prophylactic measure.

Acute cases should get 20 probilin pills a day; chronic ones, 6 to 10 daily, 3 to 5 morning and evening. In chronic cases a four weeks' course, followed by a short interval, and a three weeks' course four times during the same year, are advisable.

Schweitzer concludes that Bauermeister's pills are undoubtedly remarkably efficacious in all varieties of gallstone disease, and he is convinced they will soon come into general employment.—*Gyogyaszat, Budapest, March 17, 1907.*

THE CURE OF A CASE OF OSTEOMALACIA.

In an article on the suprarenal glands and osteomalacia, in the *Munch. Med. Wochenschrift,* 1907 (p. 278), Bossi describes the almost marvelous cure of a serious case of osteomalacia by subcutaneous injections of adrenalin. The patient was a multipara of 38, who was *enceinte* in the 8th month and had a well defined osteomalacia. After seven hypodermatic injections of adrenalin, each of which consisted of ½ cg. of the 1:1000 solution, the patient fully recovered.

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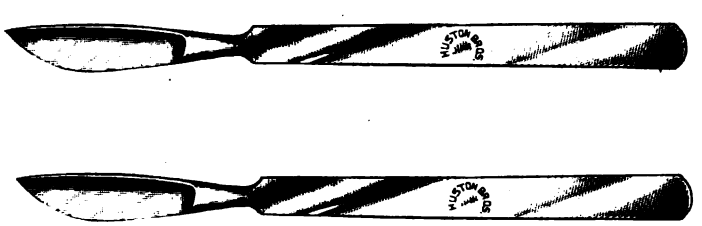

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The Railway Surgical Journal

Vol. XIV—No. 9 CHICAGO, MAY, 1908 Whole Number 264

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SCOLIOSIS.*

A. R. MITCHELL, M. D., LINCOLN, NEB.

Scoliosis, or lateral deflection of the spinal column to one side or the other from the vertical, although not classified as a disease, stands in direct etiologic relation to many pathologic processes. Any change from the vertical is included in the term "scoliosis," except those resulting from changes dependent upon osteomyelitis involving vertebral bodies, and secondarily the intervertebral discs, or from cicatricial contractions as in old empyemas.

In reviewing the history of this condition I was impressed with the efforts of writers to make their facts harmonize with their theories, and more especially to make the clinical facts and deductions from elaborate experiments agree.

Without taking your time to review the history which is familiar to all, I will simply say that Schulthess, in his contribution to the work of Joachimsthal, supports the conclusions which I have reached, although not attributing the large majority of cases to the same cause.

In looking up the literature of the subject I was amazed at its extent. So great is it that I can only refer in passing to the Volkmann-Hueter theory of muscular weakness, consequent faulty attitude, unequal intervertebral and vertebral pressure causing atrophy upon the one side, and excessive growth upon the opposite side; the superincumbent weight theory held by Roser, Lorenz, Hoffa, and others; and to the theory known as "Wolff's Law."

A recent article by Bradford in the "International Clinics" discusses the causation of lateral curvature as follows:

"Lateral curvature is what is called a static deformity, that is, it is due to the fact that the column cannot support the weight which comes upon it and bends to the side. It may develop in consequence of faulty attitudes constantly assumed. This condition is more common in growing children who are obliged to remain constantly in one position for a long time, and for this reason it is common among school children. It is more common in girls than in boys, as the latter are more active. Its frequency in a community, in a measure, corresponds to the stringency of school life. In a slight degree it is found in a considerable percentage of school children."

Remote causes need not be sought to account for scoliosis. Given an assymetric position of the spine from any cause, the mechanism is at hand to produce in certain cases any degree of deformity; in other cases the deformity will remain stationary and will not progress beyond a mild degree.

The causes most commonly found are as follows: 1. Faulty attitude in sitting and standing, favored by improper school furniture. 2. Occupations or recreations necessitating the prolonged maintenance of a one-sided position. 3. Inequality in the length of the limbs tilting the pelvis and asymmetry of the pelvis. 4. Unequal vision or hearing on the two sides, causing a twisted or bent position of the head. 5. Paralysis of the muscles of the back (ante-

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rior poliomyelitis, cerebral paralysis, neuritis, syringomyelia, traumatic paralysis, and hysteria). 6. Torticollis. 7. Empyema and its subsequent cicatricial contraction. 8. Heart disease. 9. Congenital deformities of the spine and thorax. 10. Rickets.

All authorities agree that the deformity (excepting a very few cases) makes it appearance during the plastic years of life—from birth to the fifteenth year. Eulenberg's figures correspond closely with most of the statistics I have examined. They are as follows:

In 1000:

Between birth and sixth year.....	78
Between the sixth and seventh years...	216
Between the seventh and tenth years....	564
Between the tenth and fourteenth years..	107
After the fourteenth year.....	35
	1,000

ANATOMY.

While some anatomists have held that there is a slight normal lateral curvature of the spine due to excessive muscular development on one or the other side, I do not believe this view is usually accepted. The forms of the articular processes which spring from the pedicles allow but very slight lateral movement of the spine except in the cervical and lower lumbar regions. In all movements of the spine the intervertebral discs, by the compression and relaxation of their lamellar fibers, are the principal passive element.

CLINICAL HISTORY.

Cases of scoliosis are brought to the attention of the surgeon because the watchful mother has noticed—what? Almost invariably because she has noticed that one shoulder blade "sticks out" more than the other. This slight deformity is not noticed, or is given but little thought before the child has reached the period of first rapid growth, say from the sixth to the tenth year. Its prominence forces the conviction upon the mother that there is something more than careless position on the part of the child producing it. It was supposed to have been a part of the developmental laziness analogous to "growing pains," and was neglected. Several such cases in a school may lead the school board, especially in the presence of an enterprising representative of a school-furnishing house, to change the entire anatomy of a school room because of "postural scoliosis."

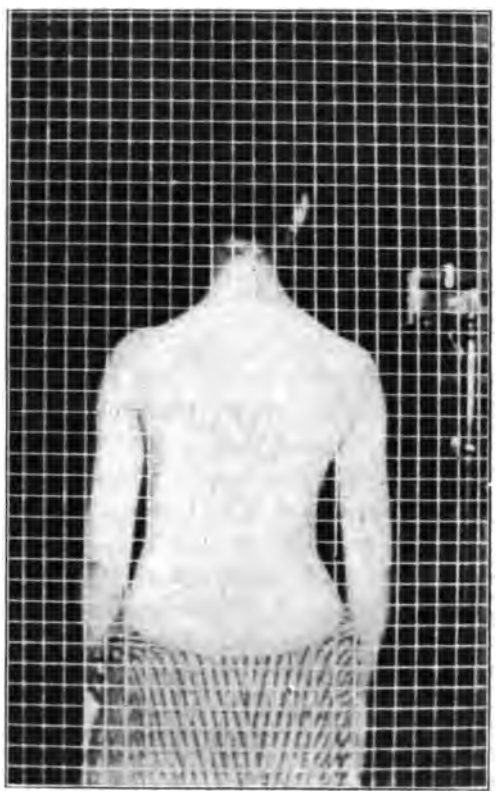
For the past three years I have been making careful observation of these cases, and in every case the first sign pointed out has been the prominent shoulder blade. In more advanced cases or in older children and in young adults the flattened hip, requiring pads to round out the figure, has been next to attract attention, this observation being made by the dressmaker quite as often as by the parents; then the crooked back, requiring side and shoulder pads to balance up the form. As there is no pain and no physical discomfort, unless the deformity is quite marked, it is accepted as inevitable, and if the subject is still in the very plastic years the deformity increases until the attainment of maturity, when changes attending growth cease.

Among the etiologic factors presented by all observers but two are uniformly recognized, *i. e.*, congenital deformity which is seen at birth, and an asymmetry of the lower limbs. Other causes, excepting cicatrices, are conjectural. Even curvatures resulting from paralysis are limited to anterior poliomyelitis or infantile paralysis resulting in an asymmetric development of the limbs. The more I have studied these causative factors, the more firmly am I convinced that all three can and should be considered under one head—asymmetry. Certainly no congenital scoliosis is possible where there is a uniform development of the vertebræ and of the intervertebral discs. Numerous experiments upon infant spines stripped of all muscles support this belief. In infantile paralysis the unequal development in the two sides of the body leads to the same conclusion.

Accepting this theory as the foundation for my convictions, let us look further into the pathology of these cases. Asymmetry being the first step, the subsequent changes, be they great or small, are dependent directly upon this primary fault. When the child begins its active life accommodative changes take place in the intervertebral discs which are compressed slightly upon the short side of the curves, while

they are expanded upon the long or convex side. All this is taking place during the plastic period of childhood and youth, while rapid growth is going on. The compression is in no way due to superincumbent weight, but wholly to compression resulting from faulty position. Slowly ligamentous and muscular changes, accommodative entirely, follow. As development goes on the curves increase. The development on the short side of the curve is retarded, while it is increased on the long side. This being true, the most marked cases will be found in young adults who have not had the benefit of proper early treatment, and I believe the facts bear out this theory. All cases with equal degrees of symmetry do not develop equal curvatures, but this can be accounted for by the unequal development in different individuals.

This theory is not accepted by Dr. and Mrs. Clapp, who are at the head of the Department of Physical Training in the University of Nebraska. For a number of years careful observations have been made in this institution, especially in the woman's department, and the following figures give approximately the results:



The device by which these photos were taken is the invention of Mrs. R. G. Clapp, head of the Women's Department of Physical Training at the University of Nebraska. It consists of a platform which is kept true with the aid of a spirit level which forms a part of the platform. A vertical frame at one edge is supplied with vertical and horizontal cords. The subject for investigation is placed upon the platform, and one of the vertical lines falls through the center of the seventh cervical spine. The readings are readily told off by the number upon the frame.

In 2,700 cases examined by Mrs. Clapp, the ages ranging from 17 to 20 years, about 62 per cent showed some curvatures; 60 per cent compound curves; about 40 per cent a right dorsal without a corresponding compensatory curve; but 1 in 25 asymmetry of the limbs. Among the men, out of 439, 47 (or 17.6 per cent) showed varying degrees of scoliosis.

The following is the blank form used at the University of Nebraska:

No.....

WOMAN'S GYMNASIUM

UNIVERSITY OF NEBRASKA.

LINCOLN

PERSONAL HISTORY BLANK.

Name in full.....
Present address .....
Home address .....
Date of birth.....
Birthplace of self, town.....State.....
Birthplace of father, state.....
Birthplace of mother, state.....
Birthplace of father's—
father .....
mother .....
Birthplace of mother's—
father .....
mother .....
Father's occupation at date of your birth.....
Mother's occupation before marriage.....
Which do you resemble most in physical build, father or mother?.....
If either parent is dead, of what did father die? ..... mother? .....
Underline all the following that have occurred among near relatives:—Consumption, heart disease, cancer, scrofula, dyspepsia, catarrh.
Underline all the following that you have had: Pneumonia, typhoid fever, inflammation of bowels, diphtheria, rheumatism, hemorrhage, neuralgia.
Underline all the following that you are subject to:—Throat troubles, catarrh, colds, heart troubles, biliousness, constipation, indigestion, headache, sleeplessness, nervous trouble.
Describe all serious injuries you have sustained and all surgical operations you have had performed .....
.....
State the kind of work in which you have been mostly employed .....
Underline any of the following kinds of exercise in which you have engaged:—Basket ball, tennis, swimming, rowing, bicycling, horseback riding, golf, hockey.
State what regular work in gymnastics you have had, and whether with or without an instructor.
.....
.....
How many hours do you usually spend in sleep? .....
Number of hours weekly devoted to—
Lecture and Recitation.....
Home study .....
Condition of
Heart .....
Lungs .....
Back .....
Chest .....
Shoulders .....
Hips .....
Poise—Head forward, Hips forward, Relaxed .....
Eyes ..... Ears ..... Nose .....
Skin ..... Circulation .....
Muscles ..... Nutrition .....
Respiration ..... Digestion .....

MENSTRUAL PERIOD.

Age when first taken unwell.....years..... months.
Frequency, every.....days. Duration .....days.
Suffering:—Severe, some, none. Suffering, how? Languid, pain, headache.
At this time is study or mental application more of an effort? Yes. No.
At this time do you take any form of exercise? Yes. No.
Remarks: .....

Regardless of these figures, and, so far as I know, one authority only—Dr. Jacob Boline of New York—supporting the theory of asymmetry, I am still convinced that it is correct.

The subject is of especial interest to us as railroad surgeons because of the atrophied lower limbs and crooked spines which are presented by claimants in personal injury cases. A limb will undergo temporary circumferential alteration from a simple injury which puts it out of use for a time, but it will not change much in length except from a badly adjusted fracture. If an atrophied limb presents after an accident, before making a report measure

its length in comparison with its fellow. If it is shorter there is surely a scoliosis. If the claim is for a lateral curve of the spine, make comparative measurements. If one leg is shorter than the other *there has always been* a lateral curve.

I have not mentioned the accompanying changes in the position and form of the chest walls, nor the visceral alterations which take place in all cases. My object has been to present my belief that all cases of scoliosis, not due to tuberculosis or other osteomyelitic disease or to cicatricial contractions, are initiated by and dependent upon asymmetry.

THE TREATMENT OF BURNS AND SCALDS.*

T. A. O'BRIEN, M. D., EMMETTSBURG, IOWA.

The ideas formerly given will surpass any small donation I may make, to the knowledge on a subject of no little importance to the railway surgeons. In the treatment of burns and scalds it is my aim to add a little to the already extensive papers that have been read on the subject at our past meetings, and in selecting this for my paper I propose to present the treatment which has been found most satisfactory to me.

The first and foremost to be considered is "shock." We find ourselves confronted with this condition in all degrees of burns and scalds, and it needs our apt attention in every case, whether mild or severe. Our first effort should be to lessen shock by protection of parts by exclusion of air; remove patient to suitable quarters, of moderate temperature; apply heat uniformly; stimulate patient with ammonia and whisky; hypodermics of strychnia; drinks of hot coffee, etc. And last, but not least—*rest*—this being the important feature of reducing shock to a minimum. Perfect rest is required in these cases before attempting further procedures of cleansing and dressing parts (other than first aid dressings, which will be hereinafter mentioned).

After shock, the next and most important is, the *anesthetic,* and the safest and best anesthetic is preferred. It has been the practice in the past to administer chloroform; but now we have an analgesic and anesthetic combined, of no little reputation, which may be used in these cases, as well as in all cases of major and minor surgery, and, although not long in use, may be safely relied on. I refer to the H. M. C. Comp., which may be used hypodermically, or by the mouth. Here we have a safe combination, which, if administered properly, leaves no untoward effects after its administration as an anesthetic.

The manner of administration of the H. M. C. Comp., and its dosage, is as follows: ¼ grain being the usual amount given, follow in one-half, one or two hours with a second ⅛ or ¼ just at the time of operative procedure. Repetition of the first dose is hardly ever required in cases of burns and scalds.

The effects of the hypodermic method is that of perfect sound sleep, during and after its administration, and the continuation of same for some hours after. One of the principal claims for this anesthetic over others is, no ill effect after administration, no nausea, no vomiting, need be dreaded, the normal rallying of the patient several hours after a sound and helpful sleep. Thus we have an aid in the treatment of shock and as well an anesthetic and analgesic of great value in producing prolonged rest and quiet, which makes it doubly serviceable. This sleep after recovery is just what is wanted, and the patient can be disturbed at will; which is unnecessary after the dressings have been applied. It is the practice of some surgeons to use chloroform just at the time of operation. This, however, is necessary only in cases where an extensive area is involved and when profound anesthesia is absolutely required, and then but very little is needed. When chloroform is used the patient should be carefully watched, as cyanosis, paresis, and other alarming symptoms are often liable to present themselves.

First Aid or General Treatment.—Here I wish to make mention of the first dressings when called to treat cases of any degree of burns and scalds. All that will be required at

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

first, is to apply several layers of gauze thoroughly saturated with a saturated solution of sodium bicarbonate, then cover the parts with wool or cotton and oiled silk held in place with a bandage, after which stimulation, etc., can be given and the patient removed to suitable quarters; and, as above stated, before proceeding with further treatment.

After recovery from shock, and after anesthesia is complete, the "first aid" dressing can be removed and the parts cleansed antiseptically and accurately dressed according to the degree, and extent of surface involved.

Treatment of Burns and Scalds of the First Degree.—Innumerable are the remedial agents recommended to us in the treatment of burns and scalds. The methods which I have found most satisfactory are as follows: The first, thorough cleansing of parts with a warm antiseptic solution of boric acid, thymol, liquor antiseptic compound or of any of the mild formulas can be used, normal saline solution, etc. I have found a saturated solution of sodium bicarbonate, or fluid extract of pinus albus and sterile water in due proportions, very good as applications in this degree. Applied for some few hours after using thick layers of gauze covered with cotton or wool and oil silk, held in place with Z. O. adhesive or bandage.

Dressings of burns and scalds of this degree can be changed often, and we should be guided by the symptoms of pain, and extent of surface involved. I usually renew dressings every one, two or three hours until parts are comfortable or pain ceases. The dressings in the after-treatment should consist of thick applications of soothing ointments or pastes, covered with layers of gauze, etc. The following formula has found favor with me and can be used in liquid, paste or ointment, as may be convenient to the surgeon.

Ol. olivum, vaseline or lanoline	℥iv
Campho-phenol, or its equivalent	℥ss
Menthol	gr. x
Cocain	gr.iv

Mix thoroughly.

My usual method is to apply one or two layers of gauze, over which the above liquid, ointment or paste is applied, covering the entire area, and a little to the outside of same, with the usual covering to exclude air.

Many other applications are highly recommended, among these are diachylon plaster, zinc oxid. Carron oil is an old and good mixture and still is used by many. Ointments containing ichthyol, stearate of zinc are fine, and picric acid solution also. One thing which is of the utmost importance is that the dressings be moist. Dry dressings have been used, but the moist dressings are better and are used with the greatest benefit in the treatment of this and as well other degrees. It might be well to mention here the necessity of having in our emergency satchel some of the above named suitable formulæ, along with a few packages of first aid dressings. The saturated solution of sodium bicarbonate, or the fluid extract of pinus, and pastes all ready for immediate use.

In cases where the eye is involved use solvents for acids and alkalies. Use adrenalin solution 1 to 1000, or 1 to 2000 with cocain 2 or 3 per cent, after which use packs of gauze, saturated with the following formulæ:

Acid boric (5% sol.)	℥vi
Adrenalin 1 to 2000 Cocain (2% sol.)	aa℥i

M. Sig. Apply and cover parts.

In the after-treatment the use of boric acid paste or the following solution can be applied.

Aqueous fl. ext. hydrastis	3ss
Acid boric	℥i
Liq. antiseptic or boro-thymol	℥ss
Glycerin	3ii
Pulv. borax	gr. xii
Aquæ dest.	℥viii

Cocain mur. can be added and mix gr. iv or v.

Sig. Apply freely to parts on gauze. Margins of either canthus must be carefully protected and kept separated; frequent baths of boric acid and sterile warm water three or four times daily, with usual dressing as before.

Treatment of Burns and Scalds of Second Degree.—After the first aid dressings, and after reaction from shock has been established, an anesthetic administered, the first procedure is to thoroughly cleanse the parts with the usual antiseptic precautions without dis-

turbing the vesicles or bullæ which are present; next all vesicles and bullæ should be opened and all devitalized tissue removed and the denuded parts thoroughly cleansed with a mild warm solution of boric acid 5 per cent or peroxid of hydrogen and sterile water, 1 part of former to 3 parts of latter, using large quantities at a temperature of 90 to 95°. Then apply dressings of an antiseptic composition, over which several layers of gauze, cotton or wool can be applied and retained in place in the usual way.

Dressings should be changed at intervals of 12 to 24 hours, the parts thoroughly and antiseptically cleansed, and as the granulating process ensues care should be taken in the cleansing of parts, lest these granulations be disturbed. Thick ointments or pastes in these dressings act well. The following formula will be found of value in cases of this degree:

Acid boric	℥ss
Acid salicylic	3i
Amyli	℥iii
Benz. ox. zinc	℥ii
Lanoline	℥iii

Mix into paste, apply thick to area involved, cover with several layers of antiseptic gauze, etc., in the usual manner.

The following formula also makes a good application:

Ichthyol	℥i
Stearate of zinc	℥ss
Benz. ox. zinc	℥i
Lanoline	℥i

Mix. Spread thick and cover parts with dressings.

One formula holding a high reputation over many of the others given is as follows (and I use this combination frequently with fine results):

Bismuth subiodid.	Hydrastis.
Phenol.	Acetanilid.
Thymol iodid.	Acid boric.

Zinc peroxid in due proportions. Mix into fine powder, using lanoline as an ointment base.

This formula is prepared by several firms, put up in 2 oz. boxes and from i3 to ℥j of this powder mixed with 1 to 4 or 6 oz. of lanoline, makes one of the best antiseptics and nontoxic ointments available, in burns and scalds, and likewise for the treatment of ulcers, and suppurating wounds.

During the healing process of burns and scalds of the extremities, position plays a very important part; the limb should be elevated a little and kept so in a swinging apparatus for this purpose. The manner of accomplishing this is by adhesive straps and loops applied to the healthy portions of limb and placed in a metal swing apparatus with hooks and loops. This is very much like the apparatus used in cases of fracture of limbs, protecting the limb from the weight of the bed clothes. In this the limb and affected parts are protected from pressure and easy of access in dressing, besides giving perfect comfort. If joints are involved the limb should be kept in a straight line until parts are healed and regain the normal condition and movements. Under this mode of treatment, and position, during the healing process, the resulting cicatrix instead of assuming the character commonly known in such tissues, remains *smooth and elastic,* and is not apt to undergo contraction; thus leaving an irregular, escharotic surface, and as well deformity of the parts involved, after the healing process has been completed.

Treatment of Burns of the Third Degree.—Stimulating and supporting, with strychnia, whisky, ammonia, and heat applied to all portions of the body. All measures should be used to prevent collapse, if possible. Subcutaneous salt infusion, etc., be given. These cases are all to be treated by reparative and plastic surgery. After the first aid dressings have been applied continuously, reaction from shock gained and anesthesia complete, thorough cleansing of the parts with the usual antiseptic method, and removal of all devitalized tissue involved, skin transplantation should be practiced. Large skin flaps give best results in these cases, thus preventing large contracting cicatrices and deformity. The transplantation method overcomes the secondary dangers of exhaustion, prolonged suppuration, erysipelas, pyemia, septicemia, etc. In cases where skin grafting is not practiced and an extensive area

is involved, antiseptics of non-poisonous character should be used for cleansing and dressing, after which the boro-salicylic paste or oil mixture can be applied. Over stimulation should be carefully guarded against. The use of strychnia, while indicated at first, should not be long continued, as sometimes greater depression is produced. Dressings are to be changed as indicated by suppuration, etc. During the first few days great warmth and protection of parts are important, with nourishing food in moderate amounts, and given as frequently as every 2 hours, other medicaments as may be indicated to aid and build up the system, among which may be enumerated: 1, tonics; 2, stimulants (vasomotor and cardiac). Diuretics and saline laxatives should also be given as indicated.

Where extremities are burned, involving toes, fingers, and portions of foot or hand, resection and amputation often becomes necessary.

DISCUSSION.

Dr. F. R. DeHoney, Holdenville, Okla.: I would like to ask the essayist if there is any kind of treatment that is valuable or that can do any real good in the way of skin grafting after having a burn which has removed all of the skin from the soles of the feet? Is there anything which will bring about the result so that a child will ever walk again? I have the case of a baby 2 years old who walked through live coals and burned all the skin and some portion of the muscles from the bottom of the feet. I have the case on hand yet and am not able to control it. I cannot skin graft on the bottom of the feet for the simple reason I have no skin suitable for grafting.

Another question that I would like to ask, because I did not understand from Dr. O'Brien's paper, the application for burns of the third degree over a large surface. A man was burned on the top of the head and forehead and the palms of the hands, and I never was able to stop suppuration until I made a mixture of iodoform and ichthyol. I did all the things mentioned by the doctor, I believe, and yet pus was constantly present. It seems as if germs had got into the bottom of the wound and stayed there and it was only by the use of 10 per cent iodoform in ichthyol that I got rid of them.

Dr. J. E. Minney, Topeka, Kans.: In September I witnessed this Lanphear method of anesthesia. I understood they gave a ¼ grain of morphin, 1/100 of hyoscin and 1/100 of cactin about 3 hours before the operation, repeating the dose about an hour and a half before the operation, and then another ¼ grain, the same dose, about five or ten minutes before the operation. In ordinary cases I think they give but 2 doses.

The anesthetist told me they used a dram and a half of chloroform and the operation required two hours. It was ideal so far as the time and the character of the operation was concerned. What impressed and even scared me was this: the patient looked black, cyanosed, and I kept looking for and expecting the patient to die every moment, but he did not die. I asked the anesthetist what about the respiration. "Well," he said, "it was 8 per minute; but," he said, "they had had it down as low as 6 respirations per minute." They did not seem in any way frightened, although it scared me. Being in Missouri, you know, a Missourian has to be shown, and they showed me. But I was afraid of it. I have talked to some other physicians since who have used it and in other cases, obstetrical cases, and they are against it.

So far as the administration of morphin is concerned in those cases at the time of the operation it is all right, but the continuous use of morphin of course would prevent elimination and I am sure the essayist did not intend that its use should be continued. Respecting the use of cocain, particularly to the eye, we are always very cautious about its continuous use on that organ, as it is injurious. A little of it would be all right.

Respecting strychnia, I do not know that strychnia is a stimulant to the heart. I think atropin is better in those cases. Atropin acts upon the sympathetic nervous system, relaxes the arterioles, gives the heart less work to do and at the same time if there is a heart stimulant it is one.

Dr. D. I. Christopher, Colorado Springs, Colo.: I only have a little to say along this

line; first, in connection with the first aid for a burned and scalded patient. It has come to my attention time and again that the average physician pays little attention to the shock in cases of burn and scald. They are looking after the external surface or wound and forget the real condition of the patient.

I have nothing new to offer in reference to the treatment of shock. I treat shock in burns and scalds like I treat shock in anything else—just the same way. I do not see any reason for making any change. I find that the first attention that should be given to the patient is in connection with his nervous system. You take a burn for instance—it does not have to be deep, it is the extent of the surface exposed, the little nerve filaments exposed to the action of the atmosphere that causes this shock.

Now, in reference to the blisters and so forth, I invariably puncture them and let the water out. I do not take off the cuticle at first, I leave it there to protect the nerve filaments. In a day or two that cuticle will be loosened up and become septic. Then I remove it just as soon as it becomes loosened. I have seen some good men trying to remove the cuticle when it was not loosened. When you do this you are only increasing the trouble there, because you are pulling off the cuticle and exposing more nerve filaments to the action of the atmosphere. I wait until the cuticle becomes loosened and begins to roll up, before it gets really septic, and then I remove it.

In reference to the treatment: I want to add my mite here to the open method treatment in burns of the first degree. I do not know so much about it in the second and third degree, but in the first degree I am a strong advocate of the open method. I had a case not long since where a man's face, arms and chest were scalded in the first degree. I had an opportunity to leave his face exposed and never applied a thing to it after the first attendance except a mild antiseptic solution, boric acid only once, then kept it covered a day or two, and his face was well in one-fourth of the time that it required for the remainder of the burns to become cured.

Now, I admit and appreciate the fact that we have got to overcome and combat the prejudice of the people. You take an extensive burn to the open air, no covering on it or anything of the kind, put no dressing on it, and you know what people will say. They "go up in the air" immediately. Of course you have to cater to their wishes to a certain extent. But I am satisfied in burns of the first degree, exposed to the air, with proper antiseptic treatment as first aid, will get well in one-third of the time. In the second and third degrees I doubt if it is good treatment.

In burns of the second and third degrees I wash them out with a mild antiseptic solution. The cheapest treatment, of course, is the old carron oil, but it is horribly dirty. I never use picric acid because I get it all over myself and everybody else and it is hard to get off. But after cleansing the wound, unless the burn is very extensive, the best treatment I know of is simple unguentine; it contains carbolic acid, phenol. It is clean, easily applied and it heals better and quicker than anything that I can find.

Of course I have used all the other treatments that the doctor has just spoken of and I am very glad that I had an opportunity to listen to this paper because he has given us some good suggestions. But the thing I want to lay particular stress upon is, first, attention to the patient's nervous system in the beginning, and then when you can, if it is a superficial first degree burn, leave it open to the atmosphere as much as you possibly can and you will never regret it.

Dr. M. W. Bacon, Chicago: Just a word about the H. M. C. tablets. During last summer in the Englewood hospital we began the systematic test of the H. M. C. tablets and we found about 50 per cent of the cases developed somewhat alarming symptoms. In several cases they produced a rash, a blush deeper than would result from the administration of atropin or belladonna, and a pulse rate of 120 to 160 in several cases, so that we were only able to get satisfactory results in about 50 per cent of the cases that we used it in, and we have abandoned its use in our hospital.

In regard to the treatment of burns, I

haven't anything much to offer except to say in our hospital we are using no treatment at all except the open method. When we do use dressing we use gauze saturated with ½ per cent solution of lysol.

Dr. S. Steelsmith, Abilene, Kans.: Relative to skin grafting there is a point that came to me very farcibly in regard to the grafting of skin following a burn, especially one case which was burned from the middle of the abdomen to the middle of the spine without any islands of sound skin remaining. It healed up sufficiently to leave a space about 8 inches wide and about 10 inches long. I applied grafts, long strips of skin almost entirely covering the space. Those grafts lived and everyone of them was in fine condition until the end of three weeks, and at the end of that time were even pink in color. This was the case of a girl about 7, in good health, had not lost in weight, her appetite good, and so forth. At the end of three weeks those grafts began to disappear, fade out, and at the end of about five weeks the grafts were entirely absent. After the lapse of two or three weeks more I grafted again and those grafts followed about the same process. There seemed to be no diseased condition, no family history of any specific trouble whatever, yet the grafts would live and seem to be doing finely until the end of about three weeks, when they would begin to disappear.

The case then left my hands, went to Kansas City, and was finally poisoned accidentally and died, so there was no solution.

Question by a Member: How did you continue the dressing at the end of three weeks?

Dr. Steelsmith: I think for about seven days I used strips of rubber covering them. No dressing after seven days.

Question by a Member: How old was the burn, doctor, when you began to skin graft?

Dr. Steelsmith: About six weeks the first time, probably three months and a half the second time.

Dr. L. W. Littig, Iowa City, Iowa: Just one word and that is to emphasize the importance of the statement made by Dr. Bacon and the gentleman who preceded him. I believe the best treatment of burns is the open method, and the more this method is used the less need we will have for any one of the many applications that were mentioned.

The public is not ready for the open treatment of burns. Some protective dressing must be applied. Select something that is bland, that will not interfere with the access of air. These burns are now exposed to the air just as emphatically as a few years ago they were protected from the air. The anesthetic aids that were mentioned, I think, will not be found necessary by any one who is thoroughly familiar with the use of ether. I am trying to collect statistics from the state of Iowa, and only day before yesterday a surgeon of Council Bluffs reported an anesthetic fatality in which he had used the H. M. C. tablets.

Now, one word in regard to antiphlogistine. I like antiphlogistine very much. Every now and then I am called to the country to operate upon a patient suffering from intestinal obstruction and I find the home physician has given that patient 2 oz. of castor oil every hour for 10 or 12 hours (or, in one instance, for 24 hours) and his abdomen is plastered over with antiphlogistine. The antiphlogistine externally is much better than the castor oil internally, and it washes off so nicely.

Dr. D. P. Teter, Chicago: I have used the H. M. C. tablets in a few cases, one instance being the dislocation of the shoulder joint. I gave the patient one hypodermic injection and in 30 minutes reduced the dislocation. I have, gentlemen, worked all night trying to reduce a dislocation of the shoulder with ether anesthesia and then did not succeed in doing it. I have used these H. M. C. tablets in obstetric work (instrumental deliveries) and had as perfect results as I have ever had from using chloroform. I have used it also in doing operations in perineorrhaphy and I have never had any bad results, never used any chloroform or any ether with it. As to its results in burns and scalds I don't know anything about it. I never tried it and don't know what result it would have.

In regard to burns of the first degree, as Dr. Bacon says, there is only one method, in my opinion, of treating them and that is the open method. But, as Dr. Littig says, you

have got to satisfy the people's minds that you are doing something for them and put some mild cover over it, yet at the same time I do not like to do it. Burns of the second degree have to be treated symptomatically, as also do burns of the third degree. But as to these H. M. C. tablets, gentlemen, I have had no difficulty whatever of any kind in using them. I have never used over the second injection, but its result has been remarkable in my hands.

Question by a Member: How many times have you used it?

Dr. Teter: I have used it in 4 accouchements, 1 dislocation of the shoulder joint, and a number of other minor operations.

Dr. A. R. Mitchell, Lincoln, Neb.: There is one point that I wish to emphasize in connection with the open treatment of burns. I believe thoroughly in the method. I think there is less danger of subsequent infection of burns and the dangers which follow infections when they are treated by the open method. But the one point I wish to add to the remarks that have already been made is that where you treat these burns by the open method you must have a high temperature surrounding your patient, at least 90°, in order to make them comfortable.

Dr. O'Brien (closing): I am highly delighted to have heard the discussions of the gentlemen on my paper.

In regard to skin transplantation, the method is recommended and it is always found a success. Very few cases are unsuccessful where proper care is used and proper attention paid to the dressings protecting the parts until healed.

The dressings of large areas involved, which question was brought up by Dr. DeHoney, should be thick and moist as recommended in my paper. To the best of my knowledge and belief in the treatment of these cases, if the dressing is not moist, the part will show greater signs of suppuration and likewise of depression in the patient's condition. The area should be well and thoroughly covered with thick layers, some using the Lister method, others using methods of their own.

Now, in regard to the anesthetic, I will say in defense of the anesthetic this much, that before giving the anesthetic there should be a thorough examination of the patient, an examination of the heart and the respiration; in other words, know your patient, then you will know your dose. The administration is simple, the effects are nil. By most operators it is conceded today as being *the* anesthetic, and, like the auto, it has come to stay. Reference was made to this anesthetic in obstetric cases. In cases of obstetrics the obstetrician sometimes gives the patient a larger dose than should be given. Now, one-half of a tablet should be given at the first injection and not in the first stages of labor if possible. It does not retard labor in any way or manner and the labor goes on normally uninterruptedly. It is perhaps a little slower, but very little if the smaller doses are given.

Reference was made to cocain in the eye. I, too, am of the opinion that cocain is too much used in all cases of eye trouble; 1:400 gives better results than a 2 per cent solution.

In the treatment of burns and scalds reference was made to cocain in relieving the primary conditions, the conditions that we find at our first dressing; cocain could be added if need be to the prescriptions given. Cocain is not always used by me continuously in these cases. I always use strychnin, not always as a stimulant, and likewise atropin, as might be indicated, which I failed to mention in my paper. This was brought to my notice after I had written the paper. Atropin is recommended highly.

The open method is to be adopted only in cases of burns of the first degree, and, as understood by me, to have the room at an equal temperature; this plays an important part in the treatment. The temperature of the room should be kept at 90 to 95° continuously until normal tissue is re-established.

AN INOFFENSIVE LIGHT.

A convenient night light for a sick room in a country house in which there is neither gas nor electricity may be invented by hanging a lantern from a hook screwed into the bottom of an upper window sash on the outside—*Nurses' Journal of Pacific Coast.*

CONSERVATIVE SURGERY.*

H. M. DEAN, M. D., MUSCATINE, IOWA,
Local Surgeon Rock Island System.

I have taken "Conservative Surgery" as my subject, not that it is something new or sensational, but because it is of great importance to the surgeon, and more especially to the railway surgeon.

The saving of an arm, forearm, hand, leg, or foot, or even a thumb, finger, or toe, is of great importance to the one to whom the member belongs. One can recognize this by regarding the injured member as if it were our own. In many cases, even if the injured part is deformed when it is healed, it is much better than none at all. I have always tried to preserve as much of the injured member as possible.

In many cases I have succeeded in saving injured parts which at first seemed to be totally destroyed. My time is limited, so I will report only a few cases and I hope that my efforts will set some to thinking and acting along conservative lines.

Case 1. A young man was driving a mule hitched to a small car filled with gravel. The man while driving stood on the front part of the car. He lost his balance and fell under the front part of the car. His left arm struck the track and the wheels on the right side passed over the middle third of the arm. A portion of the humerus, 2½ inches in length, was crushed. The flesh on the outer and inner parts of the arm was burst open. I removed all of the loose pieces of bone. Those pieces which were attached to the periosteum I allowed to remain. The limb was placed on a pillow covered with a piece of rubber. Carbolic acid was added to cold water so as to make about a 2 per cent solution. Compresses were moistened in this solution and applied to the arm; as soon as these became warm another cold one was applied. When the patient recovered he had a useful arm. He became a farmer and several years later I heard that he could use his arm as if it had never been injured.

Case 2. F. A. T., extremity of right thumb crushed back to first distal joint. The skin was broken at several places. I cleansed the wound and applied a solution of carbolic acid and glycerin and dressed it with a bandage. The patient was treated for five weeks and then discharged. The thumb had its normal size and shape. The thumb nail would probably be deformed, otherwise there would be no disability.

Case 3. W. L., nearly the entire length of the back of the second finger of his left hand was crushed. The hand was also bruised and scraped across its metacarpo-phalangeal joint. This patient was treated the same as in Case 2. He was discharged in 5 weeks. No deformity or disability resulted.

Case 4. M. G. R. This patient was driving over the low land along the Mississippi river. He had a gun with him and while driving he held his gun so that its muzzle rested in his right axilla. In some way the gun was discharged, the charge passing through his arm close to the head of the humerus. The bone was shattered and I was called to assist in amputating his arm. I found that the head of the humerus was separated from the shaft. A splinter 1½ inches long extended down from the outer surface of the head to which it was firmly united. I thought that perhaps this splinter would unite with the shaft, and so decided to try to save the arm. All loose portions of the bone were removed, the arm and wound cleansed, the limb placed in a comfortable position and treated as in Case No. 1. The patient recovered and had a good arm. The following summer he could drive posts with a sledge hammer.

Case 5. G. E. K. This patient went to get a load of wood. He took a gun along to shoot rabbits. When he started home he placed the gun on top of the load. On reaching home he grasped the gun by its muzzle, to remove it. In some way the gun was discharged. The load struck the lower part of his right forearm, carrying away 3 or 4 inches of the soft tissues on its anterior surface and also 1½ inches

*Read at the fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

of the radius; 4 inches of the lower ulna was laid bare. The treatment was similar to that of Case 4. A large portion of the tissue which was carried away was replaced by new tissue. The cicatrix became attached to the flexor tendons of his fingers and to the tendons of the flexor muscles of the forearm. As the cicatrix continued to contract the fingers became flexed. When the wound was thoroughly healed the patient could carry a pail full of water, or any similar object, with his right hand as with his left one and could move his fingers a little.

I have related these cases to show that one must not be in too great a hurry to make an amputation. If I think that there is the slightest chance for saving an injured portion of the body I always give it a trial. It is really astonishing to observe what the healing powers of Nature will do in such cases.

INJURIES OF THE KNEE JOINT.*

E. B. GILBERT, M. D., GENESEO, ILLINOIS.

In this paper, fractures at or near the joint, or fractures of the patella will not be considered, only accidents which have occurred in my practice will be mentioned.

In the last few years I have been called to treat the following injuries of the knee joint, punctured, incised and gunshot wounds, dislocations, sprains and concussions of the joint.

Punctured wounds are the most frequent, caused by persons falling on or running against nails, stubble, barbed wire, hedge thorns or jabbed with pitchforks. In this class of wounds those caused by the hedge thorn are the most frequent and painful, the point almost always breaks off in the bottom of the wound and is very hard to find, the thorn is poisonous and the wound is liable to be infected as well as poisoned. In the country we are not called to this class of wounds until the joint is badly swollen, feverish and painful and infection well developed.

Incised wounds are caused by any cutting instrument, most of the accidents were caused by the hedge knife, scythes, sickle, hay knives, carpenter's chisel, drawknives or falling on some hard substance such as brick bats and ice. There is always more or less shock and hemorrhage in these cases, and when the wound extends into the joint the shock may be severe.

Gunshot wounds are caused by shotguns and rifles. The shotgun, when loaded with small shot and fired at close range, makes a very dangerous wound and a hard one to treat successfully, shock, secondary hemorrhage and infection are common. It is almost impossible to clean out the foreign matter, pieces of clothing, wads and dirt carried into the wound. Bullet wounds, unless they invade the joint or bones or the large nerves or blood vessels, have not caused much trouble.

Dislocations of the knee joint are fortunately rare in my territory. I have only had two. One, an anterior dislocation, caused while wrestling; the second, an internal dislocation in a middle-aged man, who was very fleshy and had small bones. The accident was caused by the overturning of a load of hay and getting caught underneath. The first patient made a good recovery and the limb is as good as its mate. The second patient could not be kept quiet and he has a "game leg," joint somewhat enlarged and its troubles him in walking—gives out under him if he walks on uneven ground, turns in and pains him.

Sprains are caused by violent exercise and in getting off rapidly moving vehicles. Most of my cases were in men who were raising and moving buildings and in breaking horses. None were serious and all made good recoveries.

The last injury I wish to call your attention is *concussion of the knee joint.* I know of no better name. It is where the surfaces are brought very forcibly together, as a man falling off a roof or scaffold or jumping from a height on frozen ground or concrete.

This class of injuries has given me considerable trouble and I wish to report a case. J. F., aged 56, June 1, 1905, went out on the construction train. His work was to distribute ties used at switches. He had charge of 2 flat cars loaded with these ties, which are longer and heavier than the common tie. After leaving his supply at Annawan, Ill., he sat down on some ties at the end of the car and put his feet across

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

on the next car; the conductor signaled to go ahead, the engineer backed up to get some slack and the man's back and feet being across the ties he was very severely jammed; he gave a scream and fell over on his side and was carried in an unconscious condition to the caboose and brought to the hospital as soon as possible.

Condition on admission—Was suffering from shock, semiconscious, complained of severe pain in back, hips, knees, numbness in both limbs, but sensation was good. Patient put to bed, external heat applied and hypodermic of morphia given as soon as reaction had taken place. He was etherized and examined; there were no fractures or dislocations. The man was catheterized and relieved of a pint of bloody urine; in four days was able to void the urine. Hot wet dressings were applied to back and limbs and the limbs were put in blanket splints. In the morning patient was improved, pain in back and hips was better, but both knee joints were badly swollen and exceedingly painful. Same treatment continued until all pain and swelling had subsided and limbs were put in a plaster cast. After a few days this was opened, limbs were massaged and passive motion applied daily. Eight weeks after the accident after treating limbs with passive motion and massage a weak faradic current was used. Patient left the hospital Sept. 17; could walk a block or two all right, then he would have to use a cane, and if he was on his feet for half a day would have to use crutches to steady himself. He had no pain or soreness, but had a weak feeling in the joints; said he could not tell whether his knees were going to bend forward or back. I never heard from him after he left the hospital.

TREATMENT.

Punctured wounds—Enlarge the wound, remove all foreign substances, irrigate with hot bichlorid, swab out the wound with pure carbolic acid and wash with alcohol and apply hot wet dressings, immobilize the limb. I have used many kinds of hot wet dressings and unless there is some sprain or bruising of the joint I use hot saline solution. If the joint is sprained or bruised I use lead water and laudanum. Irrigate the wound once or twice daily with normal saline, and follow this with a weak solution of iodin; this line of treatment has given me the best results.

If the wound is badly infected and pus is burrowing, anesthetize the patient, open up freely and drain with tubes, keep up the irrigations and hot wet dressings.

The first part of the treatment for incised wounds is the same as for punctured wounds. Only control hemorrhage, sature up the incision, use drainage if necessary, apply hot wet dressings and immobilize the limb.

In gunshot wounds remove all foreign matter, trim up the frayed edges, control hemorrhage. Irrigate thoroughly and pack wound with gauze soaked in hot saline solution and use hot wet dressings, immobilize the limb.

For dislocations anesthetize patient and reduce dislocation, apply hot wet dressings of lead water and laudanum until all pain and swelling subsides and put limb in splint.

AUTOINTOXICATION AFTER INJURIES.*

HENRY B. HEMENWAY, A. M., M. D., EVANSTON, ILL.

If, after an accident, occurring to an apparently healthy individual, the patient is found to have fever, we are prone to look for the cause in either one or the other of two elements: first, infection of the wound, and secondly, the condition of the nervous system. In other rarer cases, from later developments, we conclude that by a coincidence the accident happens just as the patient is coming under the influence of some particular germ, such as that of typhoid fever, and consider that the accident has no real relationship to the fever.

It is seldom that we are permitted to know the condition of the patient immediately before, during and after the accident, and even when that is possible, ordinarily our attention would be so much occupied by the injury itself that we overlook other elements of the case.

In this line, a recent obstetric experience

*Read at fifteenth annual meeting C., M. & St. P. Railway Surgical Association, Chicago, December 5, 6, 1907.

gave me food for thought. Essentially parturition is like a surgical case. In the surgical case we may have a solution of continuity, local infection, hemorrhage, and nerve exhaustion which we call shock. In a confinement we may have every one of these factors present.

In the case referred to above, at about the fourth month of pregnancy, a fibroid was found on the fundus uteri perhaps as large as a goose egg. I was consulted and advised leaving it alone, but I advised an immediate exirpation of one breast on account of a suspicious tumor. The family were not satisfied and so consulted a prominent surgeon, who gave the same advice and performed the operation. Recovery was uneventful, and pregnancy continued to full term. During the last weeks of pregnancy the patient complained of the distress caused from the crowding of the contents of the abdomen by the enlarging womb. Otherwise she said that she felt fine, and considered herself perfectly well.

When I was called to the confinement labor had been slowly progressing for some time. I noticed that the face was flushed and so took the patient's temperature, which was 100° in the mouth. I found no other abnormal indication. Labor was natural. The perineum had been imperfectly repaired in a previous labor, and the cicatrix opened. After delivering the placenta I immediately started to apply a binder, and as I did so I noticed by touch and sound that the intestines were rapidly becoming distended with gas. A short time after I left the patient began to flood, but this was readily controlled by ergot, and by the time I called again she was cleaned up and feeling quite well. Temperature still 100°. I now think that I must have underestimated the amount of blood lost. In this I was entirely dependent upon the statements of the nurse and family.

The child was born early in the morning of August 26. Immediately the temperature began to rise. I used vaginal bichlorid douches, and the lochia were absolutely odorless for the first four days. The temperature was never below 100, was lower in the morning than in the afternoon, and on the fourth afternoon it reached 104°. The next morning I had a blood examination made. The results were negative for typhoid and malaria. Hemoglobin 70 per cent; white cells 20,000; red cells 3,200,000.

My reasoning now was as follows: Intestinal gas means fermentation; fermentation means the formation of toxins. Before confinement the intravascular tension was so great that few of those toxins entered the general circulation. This intravascular tension was greatly reduced by the hemorrhage, and so fluids were immediately absorbed from the intestine, carrying with them the toxins. Further: Before confinement the local opsonic protective power formed a wall to defend the system, but the hemorrhage produced so great a flood towards the vascular system as to break down this wall. Special infection of typhoid being excluded, I considered the case one of aggravated ptomaine poisoning from intestinal indigestion.

To increase the intravascular tension, considering that probably most of the intestinal poison had been absorbed, I permitted free drinking of water, and gave rather a liberal diet of easily digested food. I had used saline colonic flushing from the first day. I gave no more quinine or other antipyretics, but did use mild liver stimulation with calomel and ipecac, and used salol as an intestinal antiseptic. The fever gradually declined, and recovery was uneventful.

We might easily have a duplication of this condition, after the loss of a limb, for example. We have the same shock and loss of blood. The patient may assure us that he was perfectly well before the accident. Under ordinary conditions he may have become so accustomed to the intestinal disturbance as not to mind it; and what was a mild fermentation before the injury may be made serious afterward.

It is well known that nerve exhaustion, whether from shock or over exercise, or underfeeding, reduces our ability to ward off disease. It is apparently because of a decrease in opsonic power. The germ that may have been struggling for existence in the system for days or

weeks, suddenly finds opposition so reduced that it may multiply and grow fat. The same result occurs also from hemorrhage—the amount of blood, and its opsonic content is reduced.

It is therefore quite possible for an accident to really have a causative relation to such diseases as pneumonia, typhoid fever or tuberculosis, not because by the accident the germ is introduced; but because the resistance of the system is reduced and its spread through the body made more easy.

There is still another way in which an accident may favor the development of a disease. The local effect of an injury is inflammation. An inflamed area is like a hotbed for propagation of disease germs. In a drowning accident a young man inhaled water. The water irritated and inflamed the pulmonary mucous membrane. Three days later he had developed acute pneumonia, which terminated in pulmonary tuberculosis and death within a few months. It is not to be presumed that the pneumococcus or bacillus tuberculosis were introduced with the water.

In a similar manner the patient who is infected with the gonococcus may have no symptoms of its presence outside of the urethra. A sprain of the knee, however, reducing the resistance of the system through nervous influence, and producing a local inflammation, favors the localization of the infection in the knee.

In a similar manner an accident may bear a causal relationship to a gonorrheal endocarditis. The condition of the patient before the accident, therefore, may bear a very important rôle in determining the treatment. I remember many cases of diphtheria in my earlier practice, in which the family had made external applications, producing blisters, before a physician had been called. It was the rule in those cases for the membrane to develop upon the denuded surface.

Surroundings also must be considered, for in the same series of diphtheritic cases the first evidence was on the genitals of girls in two cases from the use of privies into which diphtheretic discharges had been thrown, and in another case of extensive burns the membrane was confined to the burns and the patient died from diphtheria, not from the burns.

To us as railway surgeons, this matter has another aspect—the legal defense of the company by which we are employed. Even though it may be admitted that the germs of typhoid, pneumonia or tuberculosis were present in the body before the accident, it is very important to know whether or not the disease has really begun to develop. An endocarditis will not develop instantly. If it is found developed at the time of first examination it is at least probable that the accident had nothing to do with it. If, however, we find practically no symptoms at first, but find them rapidly developing, it is at least possible that there is a direct relationship between the injury and disease.

Finally let me suggest that in each case, particularly of serious injury, an examination be made of heart, lungs, and kidneys if possible. Also that the throat be inspected, and evidences of gonorrhea or syphilis be sought.

DISCUSSION.

Dr. D. N. Loose, Maquoketa, Iowa: The paper is very practical, and there are several points which I think are worthy of emphasis. The absorption of toxins through the intestinal canal is, I believe, very much more common than perhaps the majority of physicians estimate, and I can readily understand how hemorrhage and shock, lowering the vitality, would destroy the opsonic protection against absorption. Hemorrhage, by lessening the blood pressure, would allow absorption to go on.

The doctor did not speak about the presence of indican in the urine. When I suspect that absorption of toxins is taking place, I make a routine practice of examining for indican. We know that indican is the result of decomposition, and my impression is that it is a valuable method of diagnosing as to the amount of absorption going on.

I would also say that in cases of injury a guarded prognosis should be given in what are apparently, and may be, minor injuries, simply for the reason that an absorption may be going on caused indirectly by the injury which would produce more serious results than the physician has set forth.

Dr. L. R. Head, Madison, Wis.: In a general way the question of autointoxication, and especially intestinal, has long been of interest to me, and not only after injury, but in a general way, it is of interest to the railway surgeon as well as to the medical man. It produces not only temporary and immediate results in the way of symptoms and signs, but organic changes in the system, especially in the peripheral nervous system. I have long been impressed with the idea that intestinal autointoxication was responsible for a great many organic changes, and I have during several years past found a good many things in various publications to convince me that this view is not far wrong. In the last two years I have had eight cases of peripheral nervous disease that were in all probability directly traceable to intestinal infection. There were four cases of chronic appendicitis in my own practice and two cases in the practice of Dr. Prince of Palmyra, Wis., in which there was no other way to account for the nervous disease but the long continued infection through the diseased appendix, and in other cases through the infection coming from the intestinal canal. This matter, as stated, is of exceeding great interest, not only to railway surgeons, but to surgeons and medical men as well, and I believe that the importance we attach to it now is only a part of the importance that will eventually be attached to it.

Dr. Hemenway (closing): A year or so ago Dr. Bouffleur called our attention to the fact that in one case as the result of failure to give definite information as to the condition of the heart, the company was obliged to pay quite roundly. Whether the heart condition was caused by the accident or not was purely problematic, but the claim was made that it was caused by the accident, and there was no way by which the company could defend itself in this case. That was one of the things that I had in mind at the time I wrote the paper.

In the case mentioned I used the colonic flushings with normal salt solution until the temperature became normal. I think that is good treatment. I did not feel that the patient was in a condition requiring the hypodermic or intraperitoneal injection of salt solution, and therefore did not use it; but undoubtedly in many cases of injury the hypodermic or intraperitoneal injection of normal salt solution would very quickly fill up the blood-vessels, returning to the full the intravascular tension without so much danger of intestinal absorption.

Examination of the urine for indican is undoubtedly of value, but just how valuable it is I do not feel absolutely certain. In other words, the presence of indican in the urine is, according to our present knowledge, an indication of the absorption of poisons, the effect of indigestion, or fermentation, but I do not feel sure yet that the absence of indican is necessarily an indication of the absence of intestinal poisoning.

One word more as to the prognosis: I feel in this case, as was indicated by what I said, that, having determined the cause, the temperature was not as serious and indication as it would have been had the temperature been caused by the absorption of some poison from the partrurient uterus. In my earlier years of practice I saw a good many cases of puerperal sepsis, but very seldom see them now. I came to look with a great deal of fear upon a temperature of even 102, and it became a routine practice for me at that time (I lived in Michigan) to use quinin, and I know that the patients got along better. This brings up another possibility, and I had that suspicion in a good many cases: Whether the real poisoning of any of those cases was not a malarial poisoning and that the infection through the uterus was a secondary trouble, for I found that the odor in the discharges sometimes came on after and not before the fever.

I remember one case in which there was an extensive vaginal slough formed, but it was formed several days after the confinement and there was absolutely no odor for several days, and yet the fever commenced to come on earlier. I think malarial infection was present. So as a matter of prognosis, if we can be sure as to the causation—the particular way in which the toxin has entered the cir-

culation to produce the fever—this has a very important bearing upon our prognosis.

A CASE OF DOUBLE AMPUTATION OF LOWER LEG, WITH UNUSUAL FEATURES.*

J. L. CROOK, M. D., JACKSON, TENN.
District Surgeon I. C. R. R.

Inasmuch as I have the privilege of exhibiting a patient in place of reading a paper, I have decided to give a clinical report of this case. Mr. Arch. Shuck, of Jackson, Tenn., 28 years old, engineer, has had double amputation of the lower leg with unusual features, and the unusual features in this case will furnish my excuse for taking up a subject with which you are all so familiar as that of amputation.

Mr. Shuck, tell the members present in your own words exactly how this accident occurred; then I will follow with description of the case.

Mr. Shuck: I came into Jackson on my train on the evening of February 22, 1906, and proceeded to take down the flag. At the front of the engine there is a step on the running board to step up onto, get the flag and step down on the running board, step down on the steam-chest cover and between the steam chest cover and the pilot bed is a step from the main frame of the engine; the bolts of that step were gone and when I stepped on it it flew up and I sat down and it shot me forward so that my right leg went under the pony-trucks, I was turned over and the leg crushed off, the front driver then ran over the ball of the left foot, causing it to be amputated at the instep, as you see it.

Dr. Crook: The right leg was simply amputated midway between the ankle and the knee. Mr. Shuck has described to you the manner of the accident, showing you that after suffering the misfortune of having one leg crushed clear off, the other foot was thrust under the wheels. He had the great agony of undergoing a similar accident twice in rapid succession, first the right leg being amputated entirely and later the wheels crushing across the other foot.

On the evening of February 22, 1906, about 11:30, I was summoned to see this man. It was a very cold night. When I first saw the patient the wonder in my mind was that he had not died outright. At that time we had no hospital facilities in my town, hence I was not really prepared in the way I should have been for the proper handling of the case. I met the patient at the station, to which he had been brought a mile and a half by an engine. With wonderful forethought on his part he had insisted on his confrères making a very tight ligature around the leg, which undoubtedly saved his life. The ligatures, made of handkerchiefs, were first applied loosely by his fellows, but Mr. Shuck, realizing his life blood was flowing away, insisted on a tourniquet and making it tight, therefore he lost comparatively little blood. He was suffering a great deal when I reached him and was much chilled and shocked from the cold. I had sent my boy to the office to have a fire built, and fortunately I had a gas stove which was immediately lighted and he was carried to the office. It was some thirty minutes before we could get the room in condition for operation. In the meantime the patient was fairly comfortable under the hypodermic of morphin, which had been administered. I did an amputation on the right leg, by the circular method.

The patient's condition was not as good as it should have been on account of being chilled, so I decided to take the chances of doing a little conservative surgery on the left leg. I explained at the time that I would not perhaps be able to save it, but that we could disarticulate that portion of the foot already crushed beyond recognition, use a bruised flap to cover over the denuded area, and at a later time amputation could be done if necessary, realizing that the only time to save the heel was before it was cut off. The disarticulation was made at the astragalo-scaphoid junction. In three days the flap sloughed away. The bottom of the heel was sound, and splints were applied to support the heel and the tendo Achillis divided. When the portion of the flap which had been

*Read at first annual meeting Joint Association of Railway Surgeons of the I. C., Y. & M. V., and I. S. Railroads, Memphis, Tenn., February 27, 28, 1908.

brought up and sutured in front sloughed we had a portion of the os calcis exposed and the articulating surface of the astragalus was entirely denuded, making an area probably 1½ by 3 inches completely exposed with no skin whatever and no tissue in front of it at all. He had a few friends, of course, who thought there was no chance of saving it, and they rather insisted on immediate amputation. I told the patient that we had time to try an experiment, that we had a good, sound heel, and if he would leave the case in my hands I would see what could be done.

In the course of a week the articulating surface of the astragalus put out very soft, velvety granulations and in ten days these were followed by a second crop more firm than the other. Then I began to entertain hopes of salvation of the heel. I asked the patient if he had any friends who would give some of their skin for him, and he said he had some who would die for him. I had seen friendship tested in this way before and doubted that the friends would show up, but, much to my surprise and delight, at the appointed time he was carried up the steps to my office by five friends who marched in and said, "Doctor, we are ready." And so each one, without flinching, allowed me to take the required skin from the arm. The grafts were laid over the surface in front, and practically 50 to 60 per cent of them lived, at least enough of them lived to form, with the aid we secured from the granulations pushing up from the thick tissue below and those coming down in front, a healthy, firm cicatrix.

You will notice that there is perfect function of the joint, and Mr. Shuck tells me that the heel is of incalculable value to him by reason of the fact that whenever the right leg becomes tired he can, notwithstanding he weighs 219 pounds, by means of his crutches, get around with this heel supporting his entire body weight.

Another feature of the case is the fact that he had an insurance policy which granted him $500 for each leg amputated above the ankle, but there was a provision in the policy that if the amputation was deferred for longer than 90 days after the accident, the $500 would be forfeited. So you can see the position this placed me in: If I waited beyond the 90 days to amputate, my patient would lose the $500 and in addition to that would lose his limb, consequently it was incumbent upon me to secure the salvation of the limb before the expiration of the time. This was a feature of the case that created some little worry on my part; I did not want to cut the foot off, at the same time I did not wish him to lose his foot and the $500 as well. While this was a side issue, nevertheless it caused me some anxiety.

Q. You left the astragalus and os calcis?

Dr. Crook: Yes. I simply took off that part which was hopelessly ground to pieces and tried to get a flap in front, which, as stated, sloughed away. The remarkable point about this case is that with nothing but the astragalus and os calcis, the weight of the body can be borne on the heel with impunity.

There are three points in relation to this case which I would like to emphasize. First, the great importance of external heat, a warm, comfortable environment in doing operations immediately following shock. As stated, when this operation was performed I was in a position where I could not do justice to myself or to the patient, the office having to be heated after the accident occurred. There was an interval of a year and a half between the closing of the old hospital and the establishing of a new one. In building our new hospital we have paid particular attention to the heating of the operating room and the emergency room adjoining, having a guarantee from the hot water company of 80° temperature. This is an extremely important point in railway surgery. Not only during operation, but immediately following we have to continue our efforts to bring the patient out of shock by hypodermic administration of remedies or the injection of hot saline solution, therefore if after operation you can take the patient into a room with no change of temperature, the chances are better.

The second point brought out by this case is the importance of conservative surgery in the interests of the company as well as of the patient. It can be readily understood that Mr. Shuck's claim for damages against the

corporation for which he works was very much mitigated by the possession of the heel. The insurance company also had less to pay, which was of small consideration in this case, but might have been greater.

Third, the man whose interest I was trying to serve at the time has a heel upon which to walk, and in this connection I want to speak of skin grafting. There is no doubt in my mind that we do not take advantage of this procedure as often as we should. I am confident that by this means we could in many instances avoid very unsightly scars, not only in cases of burns, but also in all cases of crushing injury where large granulating surfaces are to be covered. Some years ago the subject of skin grafting received more attention than of late, but my experience in this case, having probably 60 per cent success in applying grafts taken from 5 individuals, over the articulating end of a bone, has convinced me of its great utility in certain cases. The injury was entirely to the distal end of the foot, principally to the scaphoid which I took off, and I tried to save the joint in as perfect a condition as possible. If we can skin graft, as I have done in this case, over the articulating surface of a bone and secure the results shown in this case, it should certainly indicate to us that it would be well for us to practice this simple procedure more often than we have done in the past. Personally I have received so much satisfaction from this case that I have made it a rule since then to use skin grafting in my practice more often than was my custim previous to that time.

Q. Did you make section of the tendo Achillis?

Dr. Crook: Yes, with a very firm support, bringing the heel straight out. The firm support used, reinforced by adhesive straps, undoubtedly accounted for a portion of the success.

Q. Were the skin grafts used long or short?

Dr. Crook: Some were long and some short. Some of the men I skinned pretty well and others I did not skin very much, but they all said I was a good grafter when I got through.

DISCUSSION.

Dr. E. J. Johnson, Yazoo City, Miss.: I have enjoyed Dr. Crook's discussion of this interesting case, for he has brought out clearly the importance of conservative surgery in all classes of accidents pertaining to the probable loss of limbs. There is nothing I regret more than to have to amputate limbs. The description of the clinical features of this case also shows the importance of skin grafting. I have in mind a case which was badly scalded with steam and hot water, causing a slough on the tibia which looked as if we would never get any reproduction of tissue. We finally obtained consent to graft, and we had excellent results and saved much discomfort and perhaps ultimate loss of the limb.

Another point the doctor has brought out is in reference to heat in cases of shock. I had a case of double amputation, one leg above the knee and the other just below. After operation we put him into a room having a temperature of 100° and kept him there for 48 hours, keeping up the administration of saline solution subcutaneously and also strong black coffee given in normal saline enemas, slowly dribbling into the rectum. This I found to be excellent. I do not think we can pay too much attention to heat, for this is certainly an important factor in saving people in shock. We recently had occasion to do a double amputation on a colored man. Colored people show shock worse than white people, and the patient looked as though he would die from shock. We kept him for 48 hours wrapped in blankets and hot water bottles around him, in a room having a temperature of 100°, and he recovered.

Dr. D. G. Murrell, Paducah, Ky.: Dr. Crook's case shows the sort of surgery that I strongly advocate.

There is one point I want to make in regard to skin grafting. I have done some of that, not so much recently as some years back, but one particular case I have in mind was that of a negro boy who came to me, a wheel having ran across the great toe and foot. I found it necessary to disarticulate the great toe, and the wound in healing left a large ulcer on top of the foot, which showed no tendency

to heal. I attempted to get the boy to allow me to take skin grafts from his leg to put on the ulcer, but he objected, and as no one volunteered to give up skin, I took five grafts off my own forearm. With curved scissors I nicked out a small piece, and of these 5 grafts 3 caught and made islands which grew together and in a few weeks the whole thing was healed. After recovery the boy worked around my home, remaining nearly two years so that I had him under observation, and when he left me the spot on top of his foot was still white.

Dr. E. J. Waddey, Waterloo, Iowa: The question of this amputation is particularly interesting to me. I have had three cases of them in the last few years, all railroad accidents; two of them sloughed badly and one did not, they all had good, useful stumps. I did not do tenotomy in any of the cases, and that might be the cause for no better ultimate satisfaction. The two that sloughed fell into the hands of doctors who, like some others of our colleagues, solicit business from the street, and they made reamputations.

Dr. John E. Owens, Chicago: We might go a step further than in grafting skin. I have succeeded in grafting mucous membrane on the rectum and in grafting pieces of periosteum on a granulating bone surface in a large open wound, and after the latter had taken pieces of skin were successfully grafted. A friend of mine in Janesville, Wis., claims that he has covered surfaces successfully with the inner skin of the egg, freshly laid. I tried it once, but failed. I afterward succeeded with the epidermis raised by a blister.

Dr. J. P. Lord, Omaha, Neb.: Some years ago I had the pleasure of presenting some similar work to this, before the American Academy. Dr. W. J. Galbraith, who was my associate at that time, was also interested in this same work.

I made it a point at that time to emphasize the desirability of amputating the foot at such a point as would enable us to save the largest possible amount of the bony structure of the foot, regardless of the presence of sufficient flaps to cover, and in that connection this same matter of skin grafting was brought out. I have not receded from the position I took at that time, and I am gratified that our friend from the south has endorsed that method of treatment. It was my opinion at that time, and still is, that altogether too much stress prior to that time and is now laid upon the classical foot amputations. Students become impressed with the idea that they must do some of the classical procedures, it follows them into their practice, and the result is that as a rule insufficient conservatism is practiced. I, therefore, think that this presentation of the doctor is very timely.

In regard to bone being a suitable place for grafting, I wish to say that it furnishes a first-class surface. All of my experience brought that out, and in some cases, where you have an articular surface in the way, and you have in contemplation the skin grafting procedure, results may be hastened if at the time of the operation you will remove the articular surfaces, if the condition of the patient is such as to permit of any further surgery. And again, to illustrate to what extent bone will take skin grafts, I have engrafted very large bone cavities after resection where perhaps one-half of the bone was chiselled out because of osteomyelitis, and they have healed perfectly and have hastened convalescence very materially. This may not be wholly germane to the question, but I think it is somewhat original.

I had a case of avulsion of the scalp a few years ago in which a surface of the calvarium was exposed, equal to about half the palm of the hand. The question came up as to what we should do with such a large exposed area of bone. On looking up the literature I found that when the Indians were scalping pretty freely some of the older surgeons took to boring holes in the outer table that granulations might spring through and form a surface upon which grafting might be done. I thereupon chiselled and trimmed off the outer table of the skull, with the result that granulations formed which took grafts, enabling me to secure healing of this portion of the wound several weeks before the surrounding surfaces healed. Therefore, instead of being discouraged by having bone surface on which to make skin grafts, we should take courage, because

it makes a first-class bed upon which to place skin grafts.

Dr. J. L. Wiggins, East St. Louis, Ill.: I think that in this case the doctor deserves congratulation rather than the patient. Naturally, when operating we strive to preserve every particle of the body possible, and in many instances later view our success with regret. Personally on myself or my patient, I would prefer a higher, or ankle, operation, with a shorter convalescence, less pain, and a more comfortable and useful member, even though it were an artificial one.

The doctor's success in skin grafting is the real subject for congratulation in this case. This simple and every-day procedure has so many failures to its credit that we are wont to regard the success attending some doctors' efforts in this line as "luck." Nothing could be farther from the truth. The reason that we have so many failures is that we violate the rules laid down by the originator of this procedure, Reverdin, in regard to the proper preparation of the field for the reception of the grafts. Fully 80 per cent of the grafting done on the ordinary granulating surfaces is a failure. The reason is self-evident. Granulating surfaces are of low vitality, the papules extending beyond the point of proper vascularization, die, while the thin-walled vessels permit escape of serum; thus we have a film of pus and serum interposed between the graft and the tissue to which it is to adhere. Under this condition the graft dies. If the surface is in a healthy condition we shall meet with success whether we use the small graft of Reverdin, or the large Thiersch graft.

Formerly it was thought that only the grafts limited to the rete mucosum would live. If the blood flowed during their cutting they would die, also that success was in inverse ratio to their size, the smaller the graft the greater the probability of its living; but these theories have been proved erroneous, but acting upon them some ten years ago, I originated what I then supposed to be a new process, utilizing the deep layer of the epidermis from the sole of the foot. The foot after being bathed was thoroughly scrubbed, then wrapped in a moist antiseptic pack for twelve hours, the sole was then scraped with a dull knife, the epidermis being placed in a mortar and dried over a water bath. The theory was that the cells being vesiculated would adhere to the moist, raw surface by osmosis. In some instances expectations were more than realized, in some I met complete failure. I still use it when large surfaces are involved. As an original discovery it was doomed; I found that Dr. Hodgen had utilized the same material 30 years before.

Dr. Crook (closing): I appreciate the free discussion, and wish to make only a few remarks in reference thereto. I wish to say to Dr. Murrell that all of us do not present the large skin surface possessed by him, and if we started in to give away skin grafts I fear we would not have much left. I appreciate the discussion of Dr. Lord, in which he shows that he has had some results in skin grafting on bone. Some time ago I read a paper wherein I stated that in amputation of the foot, the foot should be regarded as one bone, and that we should make our amputation without any regard to the articulation of the joint, sawing right through if necessary and without special regard to anybody's method. I think that many minds have been clouded by the various names of amputations.

With reference to Dr. Wiggins' remarks about the practice of conservatism, I have never had occasion to regret this practice, because, as stated, the time to save a limb is before it is cut off. In these days of aseptic surgery we take no chance, and we can do the amputation later on if necessary. I was especially anxious to practice conservatism in the case shown, for he had only one leg left, the other having been crushed off, and if there was ever an obligation to practice conservatism it was presented here.

There is one thing I wish to add to what Dr. Owens has said about bone and mucous grafting. In case of extensive burns, in large hospitals there is an opportunity presented to surgeons when amputation has to be made on another patient to use as large an area of skin as may be desired from the limb that is to be amputated.

RELATIONS OF THE SURGICAL DEPARTMENT TO THE LAW DEPARTMENT.*

C. N. BURCH, ESQ., GENERAL SOLICITOR, Y. & M. V. R. R.

When Dr. Owens wrote to me very kindly asking that I write a paper, I answered that I was too much engaged to prepare a formal paper, but would be very pleased to make an informal and brief address to this Association. Since writing that letter I have been wondering what a lawyer could say to an association of surgeons. I confess to being an entire ignoramus in regard to surgery and all that pertains to surgery, and fortunately I have had no personal contact with that branch of science. But we have this common interest at least—we are all employed by one common master, and while I know nothing whatever of surgery, I have the greatest admiration for that profession.

In the profession of law most of our time is consumed either enforcing property rights or in the protection of property rights. In other words, in the end it is something that is measured in dollars and cents. Of course, occasionally there is a case that involves human liberty, more rarely a case that involves human life. But in the profession of surgery it is always a question of saving life or prolonging life, or making the life serve its highest degree of usefulness, and so it seems to me that when a young man makes up his mind to go into that profession he necessarily gives up all idea of gaining any large pecuniary rewards. I take it that any one who goes into the profession of surgery purely for the purpose of sordid gain, is really not a surgeon at all, that if he is going to be a surgeon worthy of the name he must practice the profession for the love of the profession. It seems to me, then, that a surgeon who is a true surgeon, is a man who has the love of humanity in his heart and the skill of schools in his hands. So it is, gentlemen, that I have come before you with the very greatest admiration of the noble profession which you represent.

In the law department we come in contact with all branches of the railway service. Unfortunately, least of all do we come in contact with the surgical department. We feel somewhat set up sometimes when we think that we are consulted by all departments—that the board of directors, the president, vice-president, and other executive officers, never determine upon the building or the acquisition of a new line of railway, without the law department being consulted as to the method and manner in which this should be accomplished; that the traffic officers, the department whose duty it is to furnish business to the road, consult us on what may be legally done under the various national and state acts regulating commerce; that we are consulted as well by the operating department, that department having charge of the operation of trains, getting the business over the road promptly and safely, and that we are also called upon by the financial or accounting department in regard to bond issues—we give advice to all these departments as best we can. But to the surgical department we cannot give advice; from it we take advice. That is the difference in the attitude of the law department toward the surgical department and the other departments of the railroad. We must go to the surgical department to get information and to coach up and for the time being secure some temporary knowledge of surgery.

While it is in rare cases that the law department comes in contact with the surgical department, yet we are employed by the same company and should be loyal to the interests of that company.

I do not know any attribute in human character that is more creditable or more to be admired than the attribute of loyalty. One can admire a man if he is loyal, even if loyal to a bad cause, and we are not in a bad cause, but in a good cause. Therefore, outside of the particular cases in which the law department is necessarily thrown in contact with the surgical department, each department should feel toward the other that if anything of interest

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to the other department comes to our knowledge, information of its existence should be given. That is, if the law department knows anything of interest to the surgical department, to put the latter department in touch with it, not because it may be required by the rules or fall strictly within the lines of duty, but because we are working for a common employer and trying to accomplish the best results for the common good. Now, my experience is that the surgical department has always responded nobly to the call of the law department, they have never yet, when called upon, failed to give all information at their command, and in a way that could be understood. Of course, I know that when you are among each other you use terms that the ordinary layman does not understand, and I have been hard put to sometimes in reading the formal reports to understand some of the terms used. But I have noticed that the profession is very fond of using words derived from Latin and Greek roots, and it is only by going back to these that I am able to comprehend the terms at all. When, however, we have called upon the surgical department in litigation we have always found the members willing to educate us up as best they can that we may intelligently conduct the legal branch of the case.

The surgical department is an exceedingly important one, not only for the reason that it represents humanity, but for another reason. Of course, as long as we have railways there will be accidents, there will be misfortune; not that a railway engine or railway track is unsafe in and of itself, but for the fact that it is operated by a human factor, and in any equation in which the human factor enters there is bound to be misfortune, negligence, accident. It may be that the party who is injured was at fault himself, it may be that his employer was at fault, but however that may be the surgical department is there to minister to the wants of that man, whether he be rich or poor, whether he be passenger or employe, whether he be trespasser or licensee.

That is the first department of the railway service that one of these unfortunates comes in contact with, and it is exceedingly important not only that you give him all your skill, which I know you do, but that he should receive the impression that you, as representing the company, and the company itself, intend to treat him fairly and justly and honorably. If I had any other idea, if I thought that the company which we represent did business on any other plane than that, I would sever my connection with it, and so would you, at this moment. But we know that our business is conducted on a high plane. Now, the impression that an injured man receives ought to be that the company who is sending the surgeon to him is going to give him what our strenuous President calls "a square deal." After the injured man gets past a certain stage and begins to convalesce, the first idea that will naturally come to him (for most men are not rich) is, "What compensation can I get?" Doubtless he will ask the surgeon about it, and, of course, the surgeon will tell him that this feature of the case does not lie within his department; but he can go just a little farther and say that the claims department of the company is organized for the purpose of handling just such matters as that, and that it has in its service honorable and efficient men who will treat him fairly and justly and that he should discuss matters with them and attempt to reach an adjustment with the company through that department before going farther. It is the proper thing where there are two honest people who have a matter to adjust that they should first attempt to make a settlement between themselves before calling in outside agencies or influences. Therefore I think it would be well for the surgical department to impress on patients that the company intends to treat them fairly and that they are doing both themselves and the company a benefit by conferring with its representative. Of course, an adjustment may not be reached, but nothing is lost in any event. The company, through its claims department, its law department, or its surgical department, has no desire to make settlement with any one who is not mentally competent to make it, or bring to bear conditions that would amount to fraud or duress. Everything must be done openly and aboveboard that the whole world can know that there is nothing to criticise.

Now, gentlemen, the main idea that occurs to me to present to you today is that we should all practice the spirit of coöperation. We have, of course, divers interests in life, we live in different communities, but we have a common interest, that of our employer, and we should always be loyal to that interest. So let all departments coöperate with each other, working together and accomplishing greater results than ever before. This is not said in the spirit of criticism, for we have had, so far as I have observed, the active coöperation of the surgical department in everything; but conditions are never ideal, and were we satisfied with just what is being accomplished we would never make any progress—there is no human progress unless there is some dissatisfaction. So I say let us all coöperate and work together and do our very best for our common employer.

I want to assure you, Mr. President and members of this Association, that I esteem most highly the honor which you have conferred upon me by inviting me to appear before you today. I am sorry that my professional engagements have been such that I have not had time to prepare a formal paper and that I have to resort to making very informal remarks, but none the less I want to thank you for the opportunity of appearing before the representatives of this noble profession. I thank you one and all.

(Upon motion, duly made and seconded, a rising vote of thanks was tendered Mr. Burch for his interesting address.)

FRACTURES OF THE SHAFT OF THE FEMUR.*

H. C. MITCHELL, M. D., CARBONDALE, ILL.

Fractures of the femur are nearly as old as the Creation. While we have no authentic account that Cain, when he slew his brother Abel, fractured his femur, yet there is a remote possibility that he may have done so.

I have been led to write on this subject because of the high percentage of ill results observed to grow out of such injuries. We know there are endless possibilities of disaster awaiting the surgeon who obtains a bad result in this form of injury. We know also how very easy it is to get just such a result, even after we have used our very best skill and care. The point or points of injury are always hidden beneath a heavy mass of muscles, and added to that we have the powerful contractions of the thigh muscles, and the enormous swelling of the limb, rendering it well-nigh impossible for the surgeon to tell whether or not he has a good result until after the lapse of several weeks, when the swelling has subsided and union has already taken place. You then discover that what you thought was a good result, is far from perfect. I must confess that it gives me greater concern than almost any form of injury I am called upon to treat.

While there are but few surgeons who do not know how to treat a fracture of the femur theoretically, practically but few succeed. When so many men skilled in their profession fail to obtain perfect results, is it not high time we were asking ourselves the reason for so many failures, and to adopt other methods of treatment which will give us a greater measure of success?

That we do fail in a big percentage of these cases we are bound to admit when we take into consideration the statements of such men as Von Bergmann, Scudder and many other eminent authorities. Von Bergmann, in giving a digest of 121 cases treated by Haenel, states that only 39 fully recovered. In 75 of the 121 the injury was permanent, with an average loss of earning capacity of 28 per cent. The average length of time required for complete recovery in these cases being 13½ months. The most frequent causes of functional impairment in these cases is shortening, crooked limbs, pain, stiffness of the knee, atrophy of muscles, exuberent callus, pseudarthrosis and decubitus.

Scudder gives a digest of 16 cases treated in the Massachusetts General Hospital, the treatment in all the cases being practically the same, a Buck's extension with outside T-splint, or a

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long Desault apparatus, and toward the end of the treatment, a plaster spica of the thigh, groin and trunk, with crutches. You will observe that they were all treated in hospital where they were equipped with all kinds of up-to-date apparatus for the treatment of such injuries. The cases ranged in ages from 18 to 48 years, which—as you know—is the active money earning period of life. Only 5 of the number had unqualifiedly perfect results, without pain or stiffness. The remaining 11 cases had limited knee joint moveemnts, aching in the thigh, pain after exercising, pain in wet weather, weakness in the whole leg and lameness in walking, due partly to shortening of the limb. These cases, as you will observe, run about parallel with those enumerated by Von Bergmann. Less than one-third have perfect results, the other 70 per cent have pain, limited motion, stiffness of the knee, and more or less shortening.

When we take into consideration that over 70 per cent of this class of cases are permanently injured, even when treated by our best surgeons, with the most approved methods, and that by reason of the permanency of their injuries they lose 28 per cent of their earning capacity, and that more than one year is required for their complete recovery, is it not time for us to develop other methods of treatment? There is nothing more certain than the fact that all the different forms of splints in use at present (and they are legion), such as Helferich's extension, Schede's vertical suspension, Hessing's ambulant, pneumatic ambulatory, Hodgen's suspension, Buck's extension, etc., are all inadequate when it comes to obtaining unform satisfactory results.

Now, in presenting this paper, I shall say nothing whatever relative to the diagnosis and shall deal with but one phase of the treatment, and I also know that the form of treatment I shall recommend is not yet a recognized procedure in all varieties of this class of injury. I refer to the fixation of the fractured ends of the bones by wiring or some other form of suture; in simple oblique, comminuted, compound and compound comminuted fractures of the shaft of the femur.

I observed the fact years ago that I got the best results in my cases of compound fractures because I invariably wired the bones, and as a result had no shortening, an easy limb kept straight, a good recovery with entire restoration of function.

If those of you present are anything like I am, when you get 2 or 3 cases of fractured femurs on your hands, you don't sleep well until you know you have gotten a good result —one that will put you past a suit for damages.

Now I hear some one say, taking into consideration the fact that this is not a recognized operation in all the varieties you have mentioned, and you should cut into a thigh and wire the bones, and the case subsequently develops infection? My answer would be, that no man who does not feel reasonably sure that he can do aseptic surgery should ever attempt it, in fact, this operation should never be done by any one who is not a surgeon.

If we can open the knee joint (the most dangerous cavity in the body for infection), clear out the blood clots, wire the patellæ and have good results in nearly every case, without infection, why should we not be able to shave, scrub and sterilize the skin of the thigh, and have a clean wound of our own making, without fear of infection?

For a number of years it has been my custom to wire or suture every case of fracture of the patellæ I have been called to treat, where there was rupture of the capsule. And of late years I am doing the same thing with fractures of the femur, where I can obtain the consent of the patient, and I can say truthfully that I have never had the slightest infection, nor failed to obtain an excellent result.

Some time ago I was called to treat a young lady with a sharply oblique of the femur in the middle third. She said: "Now, doctor, all I want is a perfect result." I told her how difficult it was to get what she had asked for and that it would be almost impossible not to have some little shortening without wiring the bones so that the powerful contractions of the muscles would not cause the bones to override each other. She said: "You can do anything you

think will be necessary, just so you give me a perfect limb." I proceeded at once to wire the bones, and today she has as perfect a limb as she had prior to its being broken.

When we wire the bones we not only get a better result than we do with splints, but we simplify very much the subsequent treatment, save the patient much pain and suffering by lessening the amount of manipulation required to the limb and overcome in a marked degree the muscular contractions. After the bones have been wired almost any kind of splint will serve to keep the limb straight. About all the extension necessary is a weight of 4 or 5 pounds. We all know how difficult and painful it is for patients of a nervous temperament to endure a weight of 15 or 20 pounds suspended from the foot, and particularly when they have a tender skin, and we have to apply adhesive straps to aid in sustaining these heavy weights. In a short time the skin will become blistered, or you set up a dermatitis. It frequently happens that when your patient is in a private house, if you visit them unannounced, you will find that your patient has slipped down toward the foot of the bed, and the weight is resting on the floor, and when you take your measurements you will find the limb materially shortened. With the bones wired, I have found it necessary to change the dressings but few times during the entire period of the treatment.

In order to make this a recognized operation in all varieties of fracture of the femur it is only necessary for us to do it. As I have already stated, it is perfectly proper for us to open the knee joint and wire the patella. In the different versions of the uterus we think it entirely admissible to open the abdomen and do a ventro-fixation or shorten the ligaments; not because we think the patient will succumb to the malady, for we know in all probability that they will not, but we simply do it to increase her comfort and prevent suffering, and yet sometimes these patients become infected and die, but that makes no difference. It is a recognized operation simply because we do it.

Now, the danger to life in wiring the femur, when done by a competent surgeon, is one of the remote possibilities. When he consider the many advantages this operation gives to the patient over the old splint, extension and counter-extension methods, I believe it is well worth considering.

Taking into consideration the fact that 70 per cent of all fractures of the femur treated by the old splint method are permanent, and that the individual is ever after deprived of 28 per cent of his earning capacity, and that the average time required for complete recovery is 13½ months, are we not only justified in adopting some method of treatment that will give us more perfect and uniform results, but is it not a duty incumbent upon every surgeon?

Briefly stated, I believe the wiring method possesses the following advantages, viz; You can rid the wound of all blood clots, prevent the interposition of muscular tissue between the ends of the bones. You can see and remove all fragments of bone denuded of periosteum. The limb is more easily kept in a straight position. You rarely if ever get shortening. Union can be obtained more quickly than by the splint method. The amount of manipulation required to the limb is greately lessened, and consequently the pain and suffering greatly diminished. The splints are simplified, less weight is required for extension and easily borne by the patient, with no danger of blistering of the skin with adhesive straps. The results are better and more uniform. The labors of the surgeon are greatly lessened, and last, but by no means least, the results are so satisfactory and uniform that the dangers of suits for malpractice are practically nil.

DISCUSSION.

Dr. C. H. Linn, Kuttawa, Ky.: I would like to ask Dr. Mitchell what his experience has been as to the limit of time required in effecting a complete cure.

Dr. Miller: I would like to ask Dr. Mitchell if he had any trouble months afterward from wiring, also if he ever had any difficulty from a mechanical standpoint in wiring in cases of very heavy, fleshy people.

Dr. W. H. Wilder, Birmingham, Ala.: I have listened with pleasure to this symposium upon the subject of fractures. There is no more

important subject to the railway surgeon anywhere in the category of accidents we are called upon to treat.

What I have been interested in more than anything else is the paper of Dr. Mitchell. It is along the line of advanced thought, there is no doubt about that. Especially for the past few months, the more prominent surgeons of the country are taking the same position the physicians take. I desire to say in regard to fractures of the femur that I have had fairly good results with Hodgen's splint for grown-up people, but for children I almost invariably use plaster-of-paris, and I presume I have had the same experience in treating fractures of the femur in children that most of you have had; that is, you have anesthetized the child and put on extension at the time you applied the plaster-of-paris, having the plaster extend from the toes to the axilla, and by this method you invariably get good results. I have in a few instances treated adults, almost, along the same line. The only thing is that adults will not stay in bed. If you will start with an adult with sufficient force, and I have seen surgeons do it, pull the leg out in full extension and put the plaster from the toes clear above the waist, you will get good results in treating fracture of the femur in adults. But, as I say, adults will not as a rule remain in bed quietly a sufficient length of time.

In regard to shortening, I have heard men at conventions say they have treated fracture of the femur without any shortening. Gentlemen, I want to say that in 3 cases out of 4, if you will apply the tape measure to the limb after you get through, you will find it. It may not show in walking, the individual may put a little elevation in the heel and walk fairly well, but if you put the tape measure on you will find from ½ to ¾ inch shortening in fully 3 out of 4 cases.

I want to emphasize the Hodgen's splint. I practice in a section of country where there are many such accidents among the coal miners, and I happen to be visiting surgeon to a hospital where we do a large amount of that work, and we get fairly good results—we get the results which enable the men to go about their work. It does not always depend upon the looks as to whether or not we have a good result. If your patient gets along and can perform his usual duties about as well as before, you have a very, very good result. Were we to hold a post-morten on the individual afterward the result would look worse in the bone than it appeared during life.

I wish to congratulate the doctor on the position he has taken. I have not practiced it myself, but I believe that eventually the profession will come to it. However, I believe we would better approach the subject gradually, for if we had a bad result it would be worse for us than if we had pursued the old-fashioned course. But I am going to start in and treat a few miners in that way, for I can do more with my private patients than with railroad cases.

Dr. E. A. Doepp, Blue Island, Ill.: I would like to ask the last speaker how long after fracture does he put on the plaster cast? I agree with Dr. Mitchell in regard to wiring, because my results and the results of others that I have seen have been good. My idea has been that putting on a plaster cast immediately after fracture is a bad plan, for this simple reason: In every case of fracture there is a certain amount of swelling; you put on your cast, the swelling goes down in a certain number of days, a little atrophy of muscle takes place, and things get wabbly in there. Consequently I have come to the point where I favor the wiring of bones.

Dr. Wilder: Just as soon as I can get to the child, and I have invariably had good results.

Dr. Doepp: How is it about grown people with fractured femur?

Dr. Wilder: The same. My rule is to use Hodgen's splint.

Dr. Doepp: I beg your pardon, I thought you merely put on a plaster cast to the axilla in children. Of course, if a splint is put on and plaster applied to the waist, it does not make any difference if the leg does get wabbly in there, you get extension just the same.

I have one case in mind, that of a big boy who was run over by a train and one leg was crushed between the ankle and the knee by the

wheel passing over it, the tibia fractured in the middle third and also the fibula of the other leg. There was a discussion with my assistant in regard to putting on a cast immediately; I was opposed to it, but the cast won out, and as a result I did not like to show the case to any one. In the course of a week we found the cast was loose because of the swelling going down, and as a result I had to wire later. I believe if I had not used a cast I would have had a good result. One case particularly was that of an engineer from St. Louis, who fell from a street car as it was going around a curve, causing a compound fracture of the tibia, the bone sticking through even his trousers. I replaced the bone and set it, but used no cast until the fifth day, and I had an absolutely perfect result; and the reason I had to take off the cast was that one day he said to me: "Doctor, I think you'd better take it off, because I've got bugs in there," and when I took the cast off I found a big nest of bedbugs there, and an open wound which, however, healed perfectly after removal of the cast.

Dr. C. M. Pusey, Parkside, Ill.: I have been very much interested in this discussion of fractures. My practice in treating fractures of the femur, especially in children, has been to extend the leg in an upright position, the patient on his back, put a pulley in the ceiling and with strips of adhesive plaster make extension, running it across and down again and attaching weights to it, and I have never failed to get the very best results. You can put on enough weight to make the required extension, and it is surprising the comfort that the little folks get. I have found that the plaster cast, while effective, is heavy and cumbersome to children and tends to wear them out somewhat. For my part, I have never succeeded in getting as good results as by the extension.

In the case of adults, my experience has been that if the cast is put on early the swelling will go down and the cast become loose, therefore I never put a cast on till about the sixth day. I have used splints in the manner described by Dr. Fry in his paper, which is, I believe, the better method; but wiring is, in my opinion, a step forward in surgery.

Dr. W. Woodbridge, Central City, Iowa: I have used plaster casts a great many times primarily, but it has been my custom to split the cast down in front as soon as it sets, then put on a roller bandage. In the event of the swelling either going down or increasing, that adjustment lets the cast give sufficiently so that there is no danger of the limb becoming "wabbly," or from pressure, and I have never had bad results from applying a plaster cast. By this means a splint is made that gives perfect contour, as you mold it somewhat, and it fits in every case.

I have wired a number of compound fractures of the tibia (never of the femur), and the results have always been good. In the case of one little boy I first irrigated the parts thoroughtly with strong antiseptic solution, then wired the fractured tibia and put on a plaster cast, leaving it so that I could see what was going on, and I had a very good result.

Dr. W. E. Rice, Tuscola, Ill.: I am an advocate of the plaster cast. I apply it immediately, and the next morning I split it from top to bottom. I do not, however, use the roller bandage, but apply strips, then if any change occurs the cast can be loosened or tightened. I not only split the cast, but cut out a little bit. Then in about ten days I put on what I call the permanent dressing, and I have always had good results.

Dr. I. F. Firebaugh, Robinson, Ill.: I have been very much interested in these papers. I do not know much about fractures, but have had some experience in that line. I do not see how we are going to know exactly when we do not have shortening when some of the best authorities say that in 90 per cent of persons there is ¼ to 1 inch shortening in one of the legs before fracture.

In treating fractured femur, I have had the best success by the use of Buck's extension and sandbags. I do not believe there was ever a perineal band that was worth anything. I have treated these cases with coaptation splints, I have treated them without coaptation splints, and I have never had a result that I was ashamed of. I have never had any more than a mere perceptible limp, and in most cases not

even that. Dr. David Yandell, of Louisville, has treated them with a plaster cast, putting it on as soon as possible, before there was a particle of swelling, and he claimed that he secured good results.

Plaster-of-paris will, in my opinion, do better in children than in adults. Why? Because the bones are broken square off in children, you set the bones together and the tendency to slip is not great, and plaster will easily hold them straight. Early in my practice a death occurred in connection with the use of plaster. During my interneship in the City Hospital of Cincinnati I assisted the chief surgeon in applying plaster dressing to a broken femur. The patient, who was quite along in years, did not get along well. I called the doctor's attention to him, whereupon he took the cast off, and there was about a double handful of pus among the muscles of the calf. The old gentleman died. Possibly he would have died anyhow, but I have been very careful in the use of plaster-of-paris ever since.

I have always used Buck's extension and sandbags, and I have never had occasion to regret it. By this means we get lengthening as nearly is it can be had by any other means, the patient will be more comfortable, there will be less trouble for the surgeon, and the case will get along if it would get along under any treatment. I once had a case which united thoroughly, but the callus was absorbed and the bones came apart. I put on plaster and extension (one has to apply extension anyway, even Dr. Mitchell uses it with wiring), and the fellow went off with an apparently good leg. But the fact remains we do not always know whether we have shortening or not.

Dr. H. C. Fairbrother, East St. Louis: I would not like to let this discussion of fractures come to an end without referring in a very few words to what I consider one of the most important factors and aids in the treatment of fractures, and which myself and colleagues would not think of trying to get along without, and that is the x-ray. All fractures that take place from week to week we set with the aid of the x-ray and watch them by this means until entirely healed. We have learned that it does not make so much difference what splint is used. Some use the woven wire splint, or the plaster-of-paris (which is very hard to look through with the x-ray), or a wooden splint, but whatever splint we use it is our practice to keep the ends of the fractured bone under observation, noting the condition at least once a week.

Dr. T. J. Shoemaker, Morganfield, Ky.: I want to say something in defence of Hamilton's method of treating a case with standard and pulley. The standard must be attached to a bedstead having a solid bottom in it with a privy hole through the bottom; a mattress to fit, and either a gum sheet or some kind of oil cloth stitched to it and a hole should be made through the mattress corresponding to the hole in the solid bottom. The essayist spoke of the patient slipping down. That can be very easily remedied by elevating the foot of the bed, when the body of the patient will make the counter extension and he will not slip down. I have treated cases in that way.

I remember one lady over 50, who fell out of an apple tree and sustained a fracture of the femur, I used that sort of pulley, and the patient made a good recovery, tripped around like a girl, and never had any pain at all. I treated a young man in the same manner. Of course, in this case I had to put on larger weights, but the body was sufficient to keep up counter extension and there was perfect recovery. The surgeon takes out and puts in weights as may be necessary to make the proper extension. You will always have from ½ to ¾-inch shortening, although you think you have the leg stretched about 2 inches longer than it should be. An individual with ½ to ¾-inch shortening will soon become accustomed to walking without limping.

In regard to the discussion that has taken place as to the use of plaster-of-paris, I think the idea of putting on the plaster and before it hardens splitting it down, is a good one. I always do this when using a plaster cast. The splint can be perfectly molded to the limb, then a bandage put on the outside, and the ends of the bone kept in perfect apposition by this means. In treating compound comminuted fractures, after the preliminary work is done I first put on a temporary bandage for two or

three days until the swelling has gone down to the full extent, then either put on a starch bandage or a plaster-of-paris cast with a finished opening over wounds, and I never have any trouble. One point is always keep the great toe pointing in the right direction and in range with the curves of the knee-cap. If you fail to do this you will have a wing-footed limb.

As to treating children, I have always liked the way of treating those between 3 and 5 years of age with a splint (which I believe is Hamilton's also) that goes up about the leg, with a cross-bar on the bottom, bandaging both legs, the well one just the same as the broken one, then bandage the patient to the frame. The child can then be lifted by the frame, moved from one place to another, have a doll, "Teddy bear" and toys to play with and is kept quiet, and children thus treated get well with perfect results.

I have never had any experience with the wiring of bone, but in a great many cases I would think it was cruel, unnecessary. In some cases you might get good results, in others not.

This is a very important subject, for it comes up in every country doctor's practice. Treating fractures is a kind of mechanical art. A man who has any mechanical genius, even a farmer, may get good results, while the man who has no mechanical ingenuity, no matter what his training, never can treat a fracture successfully.

Dr. J. E. Davis, Farmer City, Ill.: There are no doubt wide and varied ideas about the treatment of fractures, and a great many good points have been discussed. We have extremes on both sides—conservative and non-conservative surgery both have been presented. Both might be modified for the benefit of surgery. One point has not been brought out in this discussion, which is this: In cases of fracture of the femur most surgeons are very uneasy for several days after they have set the fracture, let them wire or otherwise, but I rise to remind you that the surgeon should be more interested in his case about the seventh or eighth week, for that is when he may get his most injurious results. If you keep the patient under your control and know positively that he does not put any pressure upon the leg until you are thoroughly satisfied that union is complete, then it is all right. There is no question but that, in a great many cases of short femurs, the shortening occurs about that time, when the new formation is too soft to stand any pressure.

I had the wiring idea in my head considerably at one time, but men sometimes change their notions about that. I had a prominent surgeon in Chicago wire a fracture for me, and at the end of nine weeks the patient was sent home and I took about 2 inches of necrosed bone with the wire out. This took considerable of the conceit of wiring from me. So every method may have its drawbacks. I have found that the best results I have ever had were obtained by using a roller bandage with adhesive plasters and sandbags, with no extension whatever. I have never put an extension on the femur, and I have never had any shortening that amounted to much—½ inch was the most I have ever had, and I could not tell but that this was due to the fact one leg had always been shorter than the other. (Laughter.)

Dr. Mitchell (closing): The question was asked as to the length of time required for union; union in these cases is acquired in a much shorter time than in the unwired case, because of the bones being held more immobile. To my mind, one of the fertile causes of non-union in fractures of the long bones is due to manipulation of the limb and moving the bones from time to time, and in this way disturbing the union. I have frequently seen a provisional callus as large as the fist and yet the bone was freely movable in it, because the union had been disturbed or moved so often that Nature had continued to provide more from time to time until there was an exuberance of callus. When we wire we obviate such troubles.

I am surprised that in these days of aseptic surgery we should go right on treating fractures of the femur just as they did hundreds of years ago, when all our statistics prove present methods are imperfect, and also when we can go fearlessly into any cavity of the body without fear of infection. Of course, we all get infection sometimes; but it doesn't speak much for the skill of the surgeon who is unable to cleanse a limb, make his own wound, and go down and

wire a bone without infection. If you have a clean wound your wire will give you no future trouble. I can certainly see no good reason for going on and treating these cases as we have for centuries, when the statistics of eminent surgeons of both Europe and America show 70 per cent of failures.

Q. What do you mean by failures?

Dr. Mitchell: I mean all those cases in which there is some deviation from the normal condition prior to the fracture; such as shortening, crooked limb, limitation of knee motion, pain, limp, etc.

Q. Where do you consider the best point to cut in to wire?

Dr. Mitchell: I select the shallowest point to the bones, avoiding the plexus of blood-vessels, nerves, and avoid, if possible, cutting through the large muscles, and making as little trauma as possible. It is best to dissect between the muscles when possible to do so.

Q. How many wires do you use?

Dr. Mitchell: I have ordinarily found 2 sufficient.

Q. When the fracture is above the trochanter, do you wire?

Dr. Mitchell: No, I have never wired a fracture above the trochanter. I am speaking strictly of fractures of the shaft of the femur.

SUB-PARIETAL RUPTURE OF THE KIDNEY.*

JOHN G. HAYDEN, M. D., KANSAS CITY, MO.

The infrequency of this injury, together with the brilliant results accompanying the proper management of a case, make the subject of this paper of interest to men engaged in traumatic surgery. One might naturally think from the anatomic location of this organ that it is protected from the ordinary forces giving rise to injury of the glandular organs, yet it is seen that ruptures of a minor degree may occur from trivial causes.

*Read at fifteenth annual meeting C., M. & St. P. Railway Surgical Association, Chicago, December 5, 6, 1907.

ETIOLOGY.

As a rule rupture of the kidney is the result of a crushing force, as the kick of a horse, a squeezing between a vehicle and some stationary object or the passage of a wagon or buggy wheel over the abdomen or lower thorax —or a fall of some little distance.

These are the usual factors entering into this injury, though in a certain group of cases other causes must be sought. Experimental work has shown that hydraulic pressure may be a potent factor in causing rupture of the kidney. A kidney with vessels full and tied is thrown upon the floor and ruptures are caused radiating from the point of impact to the pelvis. A flaccid kidney subjected to the same force suffers only a superficial bruising.

Contrecoup is also offered as a cause by some writers.

Broken ribs and the transverse processes of the vertebræ may manifestly enter into the cause. Küster found in the human that the lower ribs may be pushed inward till they move the kidney towards the vertebral column.

Cases are on record of rupture of the kidney from muscular effort, either antero-posterior or lateral flexion of the trunk. Thus Campbell reports the case of a girl who in jumping a hedge fence felt immediate pain in the left side with pathognomonic signs of kidney tear. A case occurred in Dr. Bouffleur's service in which a freight handler in lifting a heavy box experienced pain in the back, and says he later passed blood in the urine. On coming to us for treatment some days later, no tumor mass was to be found, but he complained of tenderness on palpation in the lumbar region and there was microscopic blood in the urine. This man made a rapid recovery, as evidenced by the disappearance of all symptoms.

Other similar cases of undoubted ruptures of the kidney from muscular effort might also be cited, and no doubt a larger number of cases would be recorded if a thorough routine examination were made of all cases of pain in the small of the back with urinary disturbances following injury.

PATHOLOGY.

This injury is rarely uncomplicated because

of the force necessary to produce it. It is usually unilateral. Independent of associated lesions, it may vary from a slight bruising to laceration, partial or complete, or total destruction.

The following classification is taken partially from Morris:

1. Blood in the pelvis of kidney without macroscopic cause.

2. Loosening of fibrous capsule with hematuria. This condition may come from trauma to the parenchyma and subsequent lifting of the capsule or to a primary loosening of the capsule and tearing of the kidney substance. It has been known to follow manipulation of the kidney in operations and has been seen in cases of muscular violence and mistaken for stone because of the "colic" produced.

3. Tearing of the fatty capsule. This results in the formation of a perinephric hematoma and subsequent cyst under aseptic conditions.

4. Rupture. This occurs from a single partial tear to multiple tears, complete severance of the kidney or total destruction.

The tears usually run transversely and parallel with the uriniferous tubules, but may run longitudinally or obliquely. If the tubules alone are involved there will be no urine in the extravasation, but when the calices are opened urine escapes into the peri renal tissues and forms part of the tumor mass. If this be of any considerable amount, extension can take place retroperitoneally into the mesentery of the small gut, lift the colon forward, present in the groin, and at the root of the penis, or cause disturbance by pressure on the large vessels.

With tear of the renal vessels great hemorrhage occurs, often resulting fatally in a few hours. Large clots may form in the bladder with subsequent retention or a blocking of the ureter higher up. With the blocking of the ureter comes dilatation of the kidney and pressure atrophy of the parenchyma or the ureter may be torn from its anchorage to the pelvis by pressure. Complete tears across the kidney result in necrosis of the parts deprived of their blood supply.

Total destruction of the kidney is a most serious condition and death is an early advent, unless prompt intervention be instituted. If the patient survives the shock, portions of the kidney will show infarction.

Pathologic conditions often associated with ruptured kidney are fracture of the various bones, or glandular organs, or rupture of one or more of the hollow viscera. These may cause symptoms which mask the diagnosis of injury to the kidney, temporarily at least.

SYMPTOMS.

The symptoms of subparietal rupture of the kidney are those of rupture of or injury to other internal organs—such as collapse and vomiting with the localizing findings. The collapse and vomiting are often of minor degree and delayed, being less in kidney injury than in injury to other viscera, unless such injury to kidney be accompanied by considerable hemorrhage. Mynter describes a case of a brakeman who rode 30 miles before marked symptoms appeared, although he had one-half of the kidney crushed.

When the collapse is of long duration it usually means hemorrhage, interference with the sympathetic nerve supply or associated injuries. The collapse is also somewhat dependent on the manner in which the injury is received, being greatest in those injuries received from in front because of the associated lesions.

The severity of the collapse is not necessarily to be taken as a criterion of the outcome of the case. Some cases in which the primary shock is great recover, while some with less degree of primary shock succumb to other influences.

Ecchymosis.—When the anatomy of the lumbar region is considered with its thick muscular layers and fascial coverings, one would not expect to see ecchymosis from subparietal injury to the kidney appear here, but rather in the groin, at the root of the penis and in the scrotum. Consequently this symptom will be delayed somewhat. There may, however, appear an early ecchymosis in the lumbar region, but this is due to trauma of the superficial parts.

Hematuria.—This symptom appears in about 80 per cent of cases. It is an invaluable sign in forming a diagnosis, but the amount of blood

in the urine is by no means indicative of the severity of the lesion. Thus in complete destruction of the kidney there may be no hematuria from the rapid occlusion of the vessels—or the ureter may become plugged or severed or kinked in the presence of great hemorrhage. Where, however, blood finds its way into the pelvis of the kidney and the outlet is unobstructed, hematuria will result. But neither is hematuria pathognomonic of injury to the kidney, for it may result from a pre-existing tumor along the urinary tract, a calculus, Bright's disease, excess of uric acid, essential hematuria or from trauma to the urinary apparatus below the kidney.

As to the time of appearance and duration: Usually hematuria shows early, but may be delayed due to some temporary blocking. At times it will present for some days, disappear to return more profusely than before accompanied hy large amounts of kidney detritus. Such an event ofttimes follows the destruction of a blood clot in the pelvis of the kidney from the chemical action of the urine or to the loosening of thrombi from exertion. Such hemorrhages may recur at intervals for weeks, or the hemorrhage may be slight at first with increasing severity. Again the showing of blood may be slight and temporary with rapid recovery.

Of the other urinary symptoms, albumin may be present with or without the presence of blood—an early oliguria, anuria or polyuria in a few cases reported.

An anuria represents one or more of several influences:

1. Obstruction and atrophy of non-ruptured kidney.
2. Injury to solitary kidney or both.
3. Nervous influence as exemplified by the anuria seen in the passage of a stone or after some abdominal operation.
4. Diminished blood pressure from hemorrhage.

Polyuria as a rule is one of the manifestations of a developing interstitial process, especially when accompanied by casts.

Pyuria means infection. With the advent of pyogenic organisms comes abscess formation with its classic symptoms or an early gangrene with septic intoxication may herald a sudden demise.

Pain.—Pain with this injury to the kidney may be due to the superficial trauma or to that of the kidney. When due to kidney lesion it is usually of sudden onset and is of a deep, boring character. With painful and limited respiratory movements injury to the diaphragm may be suspected.

There is also a referred pain along certain nerves, as the ilio-inguinal and genito-crural, due to the involvement of their fibres.

With the blocking of the ureter and distension of the renal pelvis comes the pain of renal colic with retraction of the testis. Vesical tenesmus, retention and dysuria accompany clotting of blood in the bladder.

Tumor Formation.—This is sudden or delayed, depending on the rapidity of the extravasation. The nature of this mass is due:

1. To blood alone.
2. To an admixture of blood and urine.
3. Later to abscess.

Usually the mass is rounded and may fluctuate. As a rule, the colon has a mesial displacement. Infection of or injury to neighboring cavities or viscera or remote parts may at all times complicate the picture produced by the kidney.

DIAGNOSIS.

From the foregoing symptoms a classical picture is found in the typical case—viz., history of injury, pain, hematuria and tumor formation.

There are, however, cases in which some of these symptoms will be present and the diagnosis remain doubtful, *e. g.* after an injury hematuria may supervene, accompanied by shock and pain, but without the development of a tumor. In such a case these symptoms might readily come from contusion or laceration to the urinary apparatus below the kidney or from a slight injury to a new growth.

Or again, hematuria may be absent from causes recited above, but pallor, shock and tumor present, and the diagnosis remain in doubt till operation, or perhaps the post-mortem table is reached. In such cases, *i. e.* with collapse, tumor formation and rapidly progress-

ing anemia, immediate exploratory operation is always demanded.

If bloody ureteral casts, or bloody casts from the pelvis or renal tubules, or even renal tubules themselves be present, injury to the kidney is certain.

In other cases with the presence of free fluid in the peritoneal cavity, vomiting and meteorism, a tear in the peritoneum or ruptures of the liver or other organs may be so diagnosed. The presence of free fluid is important as the other symptoms may be produced by injury to the kidney alone.

The presence of hematuria alone does not speak for any considerable lesion of the kidney, as contusion may be the sole cause of this. Given, however, a fairly typical case the diagnosis will in very few instances be missed.

PROGNOSIS.

This must necessarily depend largely on associated injuries. Formerly, before the days of aseptic surgery, subparietal rupture of the kidney was attended by appalling motality. Statistics of later years show a marked decrease in the death rate due to familiarity with the trouble, improved technic and timely intervention in selected cases.

The mortality generally considered is 50 per cent. The death rate in unoperated cases being 75 per cent against approximately 25 per cent in operated cases. This later varies with the operation performed, which of course speaks for the severity of the lesion.

When death is not rapid from hemorrhage, peritonitis, anuria, gangrene or associated injuries, the life or at least the comfort of the individual is still jeopardized. Among the hazards which confront him are:

1. Nephritis of the interstitial type.
2. Pain from adhesions to diaphragm, peritoneum, or inclusion of nerves. Renal colic to passage of clots.
3. Hydronephrosis from obstruction to the urinary outlet.
4. Renal calculus.
5. Abscess formation with necrosis and sloughing.
6. Atrophy of the kidney.
7. Infection of the other kidney.

Complete recovery, however, is not at all uncommon, as shown by the well being of the individual and subsidence of symptoms.

Of the sequelæ of subparietal rupture of the kidney, hemorrhage to a greater or lesser degree being considered a natural concomitant, infection is to be most dreaded. Knowing as we do that blood forms a fertile field for bacterial invasion, and the accessibility of organisms from an injured colon, a pre-existing urinary cystitis or one produced by catheterization or finally through the circulatory apparatus, we should bear this complication ever in mind.

Infection with any of the pyogenic organisms means abscess formation with possible rupture into the pleural cavity through the peritoneum or a deeply burrowing retroperitoneal process. Timely intervention in this complication will usually turn the balance towards the side of recovery.

TREATMENT.

In nearly every case it will be found that the first indication is to combat the shock attending this injury. The patient therefore should be placed in a recumbent position, opiates administered and heat applied. It is well also in this connection to apply straps to the injured side extending at least one-half the distance round the body and the Leiter coil may help some in checking the hemorrhage.

The primary shock being relieved or, if shock continue, the question arises what is the next procedure or is the expectant treatment to be instituted. Statistics regarding the results in operated and non-operated cases largely favor the operative side, but in selected cases—lumbar tumor should be looked upon with grave suspicion and if aspiration reveal the presence of urine, detected either by the odor or the presence of urea, incision at least and drainage should be employed. If, however, the tumor mass is found to contain only blood, one or several aspirations will usually suffice to relieve the swelling permanently.

Operative.—The kidney being exposed, preferably through a transverse lumbar incision the question arises shall the kidney be removed *in toto,* resected or packed. This question is best answered by the further question, is there

sufficient blood supply to maintain the integrity of the parts? If so, tamponade to assist in the checking of the hemorrhage is sufficient.

If, however, a pole of the kidney be completely torn across, the detached portion should be removed and the injured surface of the remaining portion closed by excising a wedge-shaped piece and the application of deeply-placed absorbable sutures. A cigarette drain is usually sufficient. If the vessels are opened or if the kidney be crushed, primary nephrectomy should be resorted to with loose gauze packing.

The presence of pus or a single kidney abscess is rather an indication for nephrotomy than for the removal of the organ.

Hemorrhage.—What is the best method of combating this? The Leiter coil and strapping with absolute rest may be tried at first, but if the hemorrhage be primarly great or slowly continued with increasing pallor, early intervention is demanded. Operation is often too long delayed in hope that the bleeding may cease spontaneously.

Ergot, tannin and adrenalin may be given in full doses and have some beneficial results. Normal salt solution, either by bowel or subcutaneously, should be employed with great caution and then only after hemorrhage has ceased.

If a considerable amount of blood has escaped into the bladder and clots formed the catheter with mildly antiseptic irrigation may have to be resorted to, to relieve the vesical tenesmus and retention. Cystotomy has been used in children with doubtful benefit. Anuria is a bad symptom, and is best treated on the expectant plan by giving hot drinks and elimination per rectum. A torn peritoneum or peritonitis as a complication should receive appropriate treatment.

The diet should be liquid, in small amounts and at frequent intervals for at least two weeks.

I wish to report a case which has recently come under our observation in the Monroe Street Hospital:

W. J., male, age 22, painter. Family and previous history negative.

While working on a viaduct was thrown from stage about 18 feet high by having ropes below become entangled in a passing wagon. Fell forward, striking on head and outstretched hands. He was rendered unconscious. After return of consciousness, some few minutes later, he was unable to walk because of pain in the back and left thigh.

Was carried to the painters' car and then taken to the Cook County Hospital by the police ambulance, where a laceration over the left eye was sutured and dressed and bandages applied to wrists. He was then put in bed because of the shock and vomiting present. Restoratives of a mild order were applied. Vomited at intervals during the first night and part of the next day.

Twenty-four hours after injury blood was first noticed in the urine. He says urine looked like pure blood.

Symptoms of collapse subsided somewhat and he was brought to the Monroe Street Hospital in an ambulance 48 hours after receiving the injury. Examination at this time showed: Young man—fairly well developed—pale. Sutured laceration over left eye. Right eye swollen and ecchymotic. Bilateral Colles' fracture. Heart rapid but otherwise normal. Lungs normal. Abdomen tympanitic—some rigidity of right rectus muscle. Tumor in right lumbar region extending nearly to the right rectus muscle and filling the loin. Tumor does not fluctuate. Colon displaced toward median line. Tenderness on palpation over tumor. No external evidence of injury in right lumbar region, either anteriorly or posterior.

Pain in the upper third of left thigh. No visible evidence of injury to that region. Length of both legs the same and Roser-Nélaton line normal.

Blood in considerable amounts was passed in the urine. No clots or kidney particles. Amount 25 hours, 1,200 c. c.

Blood Examination.—Whites, 20,000; hemoglobin, 90 per cent.

Pulse, 78; temperature, 100; respiration, 24.

On admission, the patient's condition being fairly good, both Colles' fractures were reduced without anesthesia and his forearms put up in plaster-of-paris splints.

The tumor mass did not increase in size, the leucocyte count from day to day diminished and the general condition improved.

The tumor, however, did not diminish in size, and October 31, eight days after his injury, the mass was aspirated and 8 oz. of bloody fluid withdrawn. Examination of this fluid showed an absence of organisms, both to smear and culture, and there was also an absence of urea, showing the mass to be free from urine. There was a slight recurrence of the tumor, but this disappeared spontaneously in a few days.

The only other treatment this man has had was an occasional cathartic and salol or urotropin for their intestinal and urinary antiseptic action, and latterly tonic doses of comp. Blaud's pills.

The temperature has ranged from normal to a slight elevation, the highest temperature recorded being 101° F., most of the time being from 99-99.5°.

The highest pulse recorded is 124, the evening of admission, the next day going as high as 102, since which time it kept below 100. During the past several weeks the pulse has been normal throughout the day.

Liquid diet was given for two weeks. At this time soft diet was allowed, the food being gradually increased till he is now taking the regular hospital fare.

The urine in this case showed blood in considerable amounts for two weeks, then an absence for six days, since which time microscopic blood in very small amounts has been present, a probable evidence of granulations. Albumin has been constantly present in moderate amounts until recently. No casts have been found.

The patient was kept in bed 29 days after injury, when he was allowed to be up in a chair, gradually becoming more active. At the present time he is able to be up and dressed all day and to go out of doors in pleasant weather.

Examination of the urine now shows sp. g. 1013; no albumin and no sugar.

No radical procedure was adopted in this case, because:

1. Case was 48 hours old and general condition did not indicate progressive hemorrhage.

2. The tumor mass did not increase in size after he came under our observation.

3. The aspirated fluid showed an absence of organisms and urine.

4. The leucocyte count gradually returned to normal.

DISCUSSION.

Dr. D. N. Loose, Maquoketa, Iowa: The essayist mentions as one of the causes of rupture of the kidney contrecoup. This is an interesting point—whether the term "contrecoup" can be used in injuries to the trunk. I used it in one discussion and was criticized by a certain man who was good authority; he said it was not applicable except to injuries of the skull. Whether it is applicable or not, whether there is such a thing as contrecoup in abdominal injuries and whether a contrecoup could cause rupture of the kidney—these are points of importance from a medicolegal aspect.

In a suit brought by a man who had been kicked in the abdomen and the claim made that the result was an inguinal hernia, I was on the witness stand for perhaps two hours and contended that the force of a blow on the abdomen would be disseminated and could not be concentrated in one locality like the inguinal canal. The same question arises in this case—whether a blow upon the abdomen could be transferred with sufficient force to cause rupture of the kidney. If we admit that contrecoup can be given as one of the causes of rupture of the kidney, we open up, I believe, quite a large medicolegal field.

Dr. Donald Macrae, Jr., Council Bluffs, Iowa: The last speaker has brought me to my feet in order to answer that question. I have not had great experience along this line, but I have seen two cases of injury of that character; one due to the kick of a horse when the man was standing with his back to the horse. He was kicked in the side. There was absolutely no evidence on the skin to indicate serious injury, but rupture of the kidney took place, and when I saw the case a few days later there was present in the right lumbar region the large mass referred to by the essayist. The patient was in a very bad condition, the large mass practically septic. A simple incision was made and drainage established. A large amount of blood, urine, etc., was evacuated, the drainage of urine being con-

tinued for several months. It finally ceased entirely and the man recovered. The point I wish to make is that a blow upon a distant point may rupture the kidney.

In regard to the question of a blow producing hernia, I doubt very much whether a blow or injury of that character could produce an inguinal hernia unless the individual was the possessor of a congenital defect. I do not believe in traumatic hernia *per se*. However, this has nothing to do with the questions under discussion except as brought up by the last speaker.

I question the advisability of aspirating in these cases. I never like to depend upon the other end of the needle when I do not know exactly where it is, and I do not believe the essayist could swear to it that he would like to do it; there are too many intestinal coils in that region. I think the proper thing to do in these cases is to incise the sac and establish drainage, which does no harm in any case, and if sepsis is present in the kidney all the better. If none is present, then no harm has been done.

Dr. Loose: I wish to make clear the point I raised. If I understand the meaning of the word "contrecoup," it means an injury somewhere resulting in a lesion to a distant organ. Of course a blow in the region of the kidney might produce rupture of the kidney, but the point is whether we can recognize the term "contrecoup" as the cause of rupture of the kidney or any other distant organ in the body.

Dr. H. B. Hemenway, Evanston, Ill.: In the treatment of hemorrhage the essayist speaks of the use of adrenalin, but he did not make it clear to my mind just exactly how he used it. There was a time when we entertained the idea that adrenalin had a systemic effect. As I understand it, however, it is now agreed that adrenalin, administered hypodermically or in any other way, has only a local effect, that it has no general constitutional effect. I am simply asking for information upon this point.

Dr. Paul Sorkness, Fargo, N. D.: I would like to report a case which occurred one week ago today. A railroad employe was, as he expressed it, "heaving the bar" in moving the car; the car got a little too swift for him and the bar struck him on the left side over the lower ribs, rendering him not entirely unconscious, but so he could not speak or move for several minutes. They brought him to the physician's office in a state of shock and great pain, and about ¾ grain of morphin was injected. After the pain was relieved he was placed on a train and brought some 50 or 60 miles; he got in on a freight and walked some 10 blocks from the freight depot to his home.

I was called at noon and found him almost in collapse. He told me that he had urinated only once since the accident, which occurred the night before about 9 o'clock, and that urine was full of blood. He had great distension and a tumor over the region of the left kidney. Not a single mark could be found upon the skin, but he said the blow was directly from the front. The question of contrecoup comes up in this case; it seems to me we have to admit that. I did not operate, but put the patient on expectant treatment, and two days ago when I left he was getting along all right; he was still passing a little blood, but the gaseous distension was disappearing. I did not use the needle, as I have the same fear just expressed by Dr. Macrae. I cite this case as it probably has a little bearing on the question of contrecoup.

Dr. H. B. Hemenway: In order to constitute a "contrecoup," the injury must be exactly on the opposite side from the blow. As I understand it, contrecoup is where a blow is applied to one portion and the force is carried around until it meets on exactly the opposite side, rupture occurring there. For example, a blow on one side of an egg may cause a rupture of the egg on exactly the opposite side; the waves of force are carried around until they meet. That is contrecoup. Where the tumor occurs on the same side as the blow, the probabilities are that it is the result of direct pressure on the abdomen.

I do not see how we can get a contrecoup of the abdomen which will produce rupture of the kidney. I can see very easily how a blow in front can produce a rupture of the kidney, but that is not contrecoup, because it is caused by direct pressure. As you know, by palpation we

can feel the kidney through the anterior wall. If contrecoup causes rupture of the kidney, it would be the posterior portion of the kidney that would receive the force of the blow.

Dr. W. F. Morrow, Kansas City, Mo.: So far as contrecoup is concerned, I do not see how it could occur to anything, not even to the head. If you follow the old nomenclature or classification in fractures of the skull, you will find it is claimed, that the force brought to bear passes around by continuity of structure. The whole thing, in my judgment, is wrong. The elasticity of the skull is responsible for the fracture. It is produced simply by the pressure brought to bear anteroposteriorly, and it is as liable to produce fracture on the same side of the cranium as on the opposite side. Fracture on the opposite side is, in my opinion, due to elasticity of the skull and not to contrecoup.

Dr. A. B. Poore, Cedar Rapids, Iowa: I agree with the last speaker in that I do not see how force is going to pass around the skull and do any injury on the opposite side. Of course it may pass through the skull due to elasticity. So in the abdomen or any other part where there is continuity of tissue, the force does not pass around, but through because of the continuity of the tissue. If that be true I do not see how we can get rupture of the kidney by contrecoup.

Dr. C. A. Lester, Wabasha, Minn.: I wish to go on record as being in favor of the needle. There are times when we can make a pretty good diagnosis without operation, and aspiration helps, and if used with judgment no harm results. The probe is a dangerous instrument, but under certain conditions and precautions it is a great help. In the particular case reported, if I remember rightly the essayist mentioned under physical signs the displacement of the colon toward the median line, which would make it entirely unlikely that the colon would be penetrated by the needle. Be that as it may, under proper precautions I am in favor of the needle preliminary to incision.

Dr. A. I. Bouffleur, Chicago: I would like to make a few remarks on this subject, for I feel there is a good deal more to it than the limited discussion has really seemed to indicate.

There is no question but what we have very frequent rupture of the kidney. In the first reports that you gentlemen send into the office the fact may be mentioned that there is a little blood in the urine, but that is all there is to it —in your subsequent report you do not as a rule say anything more about it. Some of those cases have died and no post-mortems were held, and it is not known whether or not the injury to the kidney was the cause of death.

I wish to impress upon you the fact that the finding of blood in the urine may indicate a serious condition. The cause is worth looking into, and the condition likewise is worth looking after. If you will study the literature of the subject, you will perhaps be surprised to find, as has been indicated in the paper, that direct force on various parts of the body has been followed by rupture of the kidney. This occurs sometimes in a very simple manner. In the experiments of Watson, who taught us so much about hemorrhage into the spinal cord, and especially as to concussion of the spinal cord, he anesthetized animals and then dropped them different distances, and he found that it did not take very much of a drop to produce rupture of the kidney and liver, but it did take quite a decided drop to produce rupture of the vessels in the spinal cord, and he found that whenever there was hemorrhage into the spinal cord there was always without a single exception decided evidences of hemorrhage into the liver and kidneys, showing that rupture occurred by force applied to distant parts of the body.

As to treatment: Should we operate in a case of this sort, or aspirate? Dr. Hayden called my attention to this case and we went over it pretty thoroughly. It came under our care some 48 hours after receipt of the injury; his head was injured, he had a double Colles' fracture and was very anemic. His condition at that time, however, was not grave, but simply showed that he had been through a very decided shock, additional confirmation of which was found in a high leucocyte count. He had a well-defined tumor which was surmounted by the distended colon. I am afraid Dr. Macrae states his exception very loosely when he says he does not know where the end of the needle is in such a

case. The end of the needle could not have been anywhere except in this hemorrhagic mass, because it was so large that a 4-inch needle going in from behind could not go anywhere but into it. The only fixed organs there were in that locality were the liver, kidney and colon, and the presence of the colon on top of this mass was plainly discernible.

I admit that our decided inclination was to open and pack it, and I also admit that if this case had come to us soon after the injury and we had found this large mass present at the time, in all probability we would have made incision and packed as well as drained. But this case came in 48 hours after the injury was received, and there was no indication of progressive hemorrhage. That was easily demonstrated, not only by the size of the swelling, but by the man's general condition. The use of the aspirator here was a simple and safe procedure, and it demonstrated two things conclusively: First, that this swelling did not contain any urine, and, second, that it was not infected. By aspiration we were able to remove several ounces of fluid, which resulted in a gradual but steady diminution of the swelling. We certainly could not have expected any better results had we operated. I do not think we need to be so afraid of the needle as a general proposition, except in the abdomen; I do not like to go through any part of the abdominal tissue, but on the posterior part of the body it is a simple procedure from which you do not need to fear serious results.

The information Dr. Hemenway gives is entirely new to me; I do not take any stock in it at all. I have seen the blood pressure come up so nicely under the administration of adrenalin over and above that produced by salt solution, that I believe it has some systematic effect, and that it is just as thoroughly indicated as is ergot in persistent oozing. Ergot has a systemic effect and has been recognized as useful in hemorrhage of the lungs and other organs, and I believe that here it is applicable the same as are small doses of morphia, the action of which is similar. The local effect of adrenalin is well known, but we also get some systemic effect.

So far as administration of adrenalin by the stomach is concerned I do not know much about it. The men who make it claim it can be given by the stomach, that it is absorbed and produces its systemic effect. My experience has not been sufficient to enable me to form an opinion, except in this way: I remember a few cases in which I administered adrenalin by mouth for persistent bleeding from the kidney with no evidences of trauma at all, and it seemed to have a prompt systemic effect, and its administration was repeated at intervals of two or three days with the same effect.

To illustrate how easily these injuries may occur: A Northwestern employe riding on the step of a car when a small stone about the size of a hen's egg was caught by the wheel and snapped back, striking him in the loin, with the result that he had a very decided hemorrhage from the kidney for several days. That man even had an overcoat on, and yet that small objeect was thrown with sufficient force to cause direct laceration of the kidney.

Laceration and contusion are simultaneous terms when applied to a glandular organ. "Contrecoup" is, I think, rather an unfortunate term to use in these cases; still we have injuries of that sort.

Dr. Hayden and I have seen a case recently in which a man sustained an injury on one side of the chest and had traumatic pneumonia on the opposite side. This was the first case of the kind I had ever seen— a distinct traumatism on one side and a distinct localized pneumonia developing on the other side which was quite characteristic of the traumatic type. It healed very rapidly. Therefore we can have contusion on one side of the body and the effect on the other; but so far as the kidney is concerned, where everything is so elastic, it seems less likely to occur except as the result of a general effect. We know that a glandular organ with such high specific gravity as the liver or kidney or spleen, is easily ruptured by any sudden, jarring force.

Dr. E. O. Plumbe, Rock Valley, Iowa: I would like to ask Dr. Bouffleur a question in regard to aspiration. As I understand it, you use the needle simply for diagnostic purposes?

Dr. Bouffleur: Yes, and also for the removal of the fluid.

Dr. Plumbe: But you would use it preliminary to incision?

Dr. Bouffleur: I think it would be perfectly justifiable to use it in a recent case under favorable circumstances.

Dr. Plumbe: It would do no harm?

Dr. Bouffleur: I do not think so.

Dr. Plumbe: In regard to the use of adrenalin, I would say that in obstetric practice I have used it for quite a number of years in connection with ergot (the latter, of course, given by stomach), and my personal experience is that I never get any systemic effect from adrenalin if given by the stomach. I invariably use adrenalin when giving ergot, and in every obstetric case where I have had severe hemorrhage it has been my practice for some time to administer adrenalin hypodermically.

I had a case about 8 or 9 years ago in the service of the Milwaukee road wherein a brakeman was injured by the caboose being turned over two or three times. The men came after me early in the morning to treat the conductor and I asked the brakeman if he was in the caboose, and he said yes, but that he caught hold of something which prevented him from going over and that he was not injured. That was about 7 o'clock in the morning. Before noon I was called to see this man and found him quite ill, with apparently no external evidence of injury, but he had hematuria and some injury to the left kidney. Under expectant treatment he recovered in 4 or five days, the condition not being at all serious. The case simply proves that these injuries are not always evidenced by immediate symptoms.

Dr. Hayden (closing): I want to thank you for the liberal discussion, but I did not mean to stir up so much trouble. I merely mentioned the word "contrecoup" as being the cause given by some writers for rupture of the kidney; I have nothing to offer in support of or against it.

The matter of hernia is, in my opinion, somewhat foreign to this subject in this regard: If there is such a thing as traumatic hernia, it must necessarily be accompanied by pain and swelling and the soreness which accompanies any contusion. The sudden development of a hernia without marked pain and swelling is indicative of a congenital condition rather than of traumatic origin.

As to adrenalin, there has been some work done by Dr. Miller on the use of adrenalin and its effects. He has found that where adrenalin is taken by mouth it does not affect primarily the blood pressure, but it has all the bad after effects of the hypodermic use of the drug. Adrenalin administered hypodermically certainly has a systemic effect. This is especially noted in the treatment of asthmatic cases. A patient who is all "stuffed up" and cannot breathe, may within a few seconds be relieved and breathing rendered easier by the hypodermic use of 15 minims of adrenalin solution.

As to the use of the aspirator in this case, I think we were entirely justified, because we were sure of our anatomic conditions there. The colon was dilated and had a mesial displacement. The kidney and the mass were posterior, and there was no other organ there which could be injured by the aspirator. It is very easy to determine when it gets into the interior of a cavity of this sort. Had we made incision at that time the patient would have been longer in recovering.

The X-Rays in Theory and Practice.

THE X-RAYS — X-RAY MACHINES — TECHNIC OF RADIOGRAPHY—THE ADVANTAGES OF THE X-RAYS IN SURGERY.

J. W. REYNOLDS, M. D., CRESTON, IOWA.

The x-rays, discovered by Prof. Wilhelm Roentgen of Germany in 1895, are the phenomena produced by the passage of high potential electricity through a vacuum tube, known to x-ray workers as the Crookes' tube.

The principles governing the production of the x-rays are very similar to those pertaining to the electric arc-light in this that the x-ray is produced by a gap or break in the electric circuit placed in a sufficiently high vacuum tube,

while in the production of an electric arc-light the resistance offered is in an air-gap. Thus also in an incandescent lamp the resistance is in a resistance filament placed in a partial vacuum. The principle of transforming electric waves into light waves is similar in all, differing mainly in degree. As shown by the spectrum, it is known that composite light is made up of many rays, among which are chemical rays, actinic rays, and heat rays, all of which are active in their natures but are not perceivable by our visual apparatus. Many of the most active radiations are invisible and greatly resembling these in this are the x-rays.

The great value of the x-rays as a diagnostic agent to the surgeon is their great power to excite fluorescence in certain chemicals, which many of the invisible light rays do not possess. The x-rays possess so much power in this direction that in this they are considered unique. As has been shown, the x-ray is considered the modified form of the invisible rays of the electric arc-light. The circumstances governing it being in the differences of generation. The x-rays radiate from the point of the positive anode in straight lines as do the rays of ordinary light. They diverge as do rays of ordinary light. X-rays cannot be reflected or refracted and therefore cannot be concentrated by lenses. They diffuse themselves, however, by collision with particles in their paths and produce what are known as the "secondary" x-rays. They can only be used as transmitted light and therefore are not valuable in camera effects. They do, however, act on photographic plates as do the ordinary rays of light and in this they become a valuable agent to the diagnostician.

The x-ray does not possess any action, with possibly one exception—that of the power of producing fluorescence, that is not already known of forms of electricity. X-rays are invisible, so are electric currents; x-rays radiate from a source in diverging lines, so do the rays in an electric arc-light; x-rays affect the photographic plate, so do electricity and electric light; x-rays will pass through the body and make a picture, and so will the rays of electric light; x-rays fluoresce certain chemicals, electric discharges do the same. Therefore, as will be seen, the x-ray differs mainly in the great degree in which it produces fluorescence and makes visible parts within parts of varying densities. That is to say, the shadow which we perceive upon the photographic plate means that that particular substance is opaque to the x-ray and has, as is known to us, absorbed the ray. In other words, it has been a barrier to the passage of the ray to the plate. We therefore get a shadow of this denser body upon our sensitive plate. On the other hand, that part subjected to the ray, offering little resistance to it, allows the ray to penetrate freely and fog the plate. The fogged condition varying with the degree in which the light has penetrated the softer tissues.

X-RAY MACHINES.

Under the head of x-ray machines, one may consider two types—static machines, and induction coils, operable from either storage batteries or from a commercial lighting wire. Either of these can be made to do good and satisfactory work if properly arranged and handled. If we have no light current, as so frequently happens in our smaller cities, then we are forced to rely on the static machine or a storage battery. If a static machine be used, one of sufficient capacity must be chosen, not less than 24 plates, so as to have amperage sufficient to produce not only a long spark but a fat one.

In referring to the primary storage battery as a source of current for x-ray work, I will content myself by saying that it is, as a rule, very inconvenient, requiring frequent charging, occupying at times valuable space, and in many instances disappointing one by becoming exhausted when most needed.

The induction coil in my judgment fulfills most satisfactorily all the requirements of the x-ray worker. There are many excellent types of induction coils, but in selecting a coil one should look to it that a thick spark can be had, as it is more desirable to have a good thick spark than a very long one.

A very necessary attachment to any good coil is the interrupter, as the capacity of the induction coil depends largely upon the manner in with the interruptions occur in the primary current. An ideal interrupter is one capable of a large number of interruptions taking place sud-

denly, completely, and equally. In my judgment the electrolytic interrupter, which is generally used in connection with the modern induction coils of today, more nearly fulfills these requirements than do any of the other interrupters.

Regardless of the type of apparatus one selects, one of sufficient capacity is essential as nothing will so discourage a beginner in this line of work as a poor and insufficient generator. This I know to be true personally, having had discouraging experiences with different types of generators. I am now using an 18-inch coil, with electrolytic interrupter, manufactured by the Scheidel-Western X-Ray Coil Company with satisfactory results.

Having a machine of sufficient capacity the next essential possession is a good Crookes' tube. There are many patterns on the market which will prove satisfactory, among them may be mentioned the plain 2-terminal, plain 3-terminal, adjustable, self-regulating, and water-cooled tubes. For my part I am partial to the self-regulating tubes and use the G. & B. tube for all rapid radiography, it being especially adapted for rapid work. The advantage of a self-regulating tube over other patterns is that one can have either a hard or soft tube immediately as occasion requires.

TECHNICS OF RADIOGRAPHY.

Nothing is so confusing to the beginner in x-ray work as are the technics of radiography, and rightly so, as so much depends upon correct technic in the production of satisfactory skiagrams. In my work I use the following technics which have proven highly successful:

The subject to be radiographed is placed upon a good wooden table and a sensitized plate, especially prepared for x-ray work, is placed directly under the part to be exposed. Between the photographic plate and the table I place a sheet of lead. The tube is placed in the holder and properly focussed so the rays of greatest intensity will strike the part at a right angle. It is quite necessary that the rays strike at a right angle so as to avoid distortion as far as possible. In deciding upon the distance of the tube from the plate many conditions must be taken into consideration. However, I usually place the tube about 20 inches from the plate and in so doing get better definition and avoid distortion and magnification of the shadow to a great extent. It is a well known fact that the greater the distance the tube is from the plate the sharper the outline. Theoretically this is true, but if the tube be placed at a long distance from the part such a long exposure is necessary that for all practical purposes a distance of from 20 to 30 inches is generally used by the most export radiographers in this country. It is being generally conceded that a minimum of distortion only is obtained at this distance.

Having the correct position and distance of your tube, the next thing to be considered is the time of exposure. In this connection, I can truly say that no hard or fast rules can be given, there being so many conditions and circumstances which govern this, such as hardness or softness of the tube, thickness of the part, the character of the radiograph desired, etc. However, it can be safely said, I think, that for hard tubes a shorter exposure is necessary than for soft tubes. I usually give an exposure of from 20 to 40 seconds for all extremities and an exposure of from 40 seconds to 1½ minutes for the trunk and pelvis, subject always, however, to the conditions above named.

If one has carefully followed good technic, all that now remains to insure a good radiograph is the proper development of the plate. With this procedure every operator should familiarize himself, for the reason that he alone knows what is to be brought out on the plate and therefore he can develop certain parts dense and certain parts light, while if he sends his plates to the photographer they will all be developed alike and in many instances fail to bring out what is desired. To properly interpret the findings upon a negative it is necessary to know the conditions under which it was taken and developed. Showing again the desirability of developing your own plates.

(Before leaving the subject of technic, let me add that it is always wise to have proper identification marks on all radiographs so as to fulfil possible legal requirements.)

THE ADVANTAGE OF THE X-RAY IN SURGERY AND TO THE RAILWAY SURGEON.

First of all let it be known that the x-ray is not a cure all and one who so places his faith is

doomed to disappointment. Surprising results, however, can be obtained by its use in many pathologic conditions; among them may be mentioned the following, in which by the use of the ray I have obtained relief or an entire cure, epithelioma of the lip and face, eczema, Hodgkin's disease, acne, goitre, ringworm, sarcoma, etc. I therefore do not hesitate to say that as a therapeutic measure in the surgeon's hands, it has proven its value in subduing many diseases which heretofore have stubbornly resisted treatment. Certainly then, from the success attained by its use in the past, we are warranted in its future employment as a therapeutic agent alone, if for nothing else; but to the surgeon, like the microscope, stethoscope, ophthalmoscope and other instruments of precision, it has become valuable as a diagnostic agent and no discovery of the past century has so aided the surgeon in the obscure field of diagnosis. The 20th century surgeon is armed with tremendous possibilities, and when we have used the x-ray as long as the other instruments of diagnostic value, then the full measure of its resources may present a more striking comparison than today.

Fig. 1.

Fracture of the radius of left forearm. Time of exposure, 40 seconds; tube distance, 20 inches.

In fractures of the bones the greatest usefulness of the rays becomes apparent and with their aid the painful manipulations, which before the days of this discovery were necessary, can now be dispensed with. In many injuries owing to the great swelling of the parts a positive diagnosis of fracture can not be made without the aid of the rays. Formerly many cases of fracture were mistaken for sprains, contusions, or other injuries. In fractures of the scapula, humerus, elbow joint, wrist, hip and pelvis, the conditions are frequently so obscure that without radiographs it is impossible to make a positive diagnosis. Again in fractures of the ribs is the use of the x-ray demonstrated and often in heavy subjects one is forced to rely solely on the ray for his diagnosis. Also in fractures of the patella, although in most cases they can be recognized without the aid of the ray, it is important to know whether there are several fracture lines or whether the fracture is complete or incomplete, which, of course, can only be shown by a radiograph.

Fig. 2.

Necrosis of the lower end of femur. Diagnosis readily made by this radiograph shows very plainly the roughness of the diseased bone. Time of exposure, 40 seconds; tube distance, 15 inches.

Leonard, in speaking of the advantages gained through the use of the x-ray, particularly alludes to the avoidance of much interference

with dressings in cases of fractures, and the obtaining of definite and absolute knowledge in fracture examinations without pain or discomfort to the patient.

In the differential diagnosis of fractures, dislocations and displacements, the ray becomes absolutely an indispensable agent.

cases have become comparatively sure and certain.

Surgical railway injuries are generally of the nature of fractures and dislocations. Therefore, the railway surgeon should, as a routine practice, have skiagrams taken of all cases that he is called upon to treat and they should be

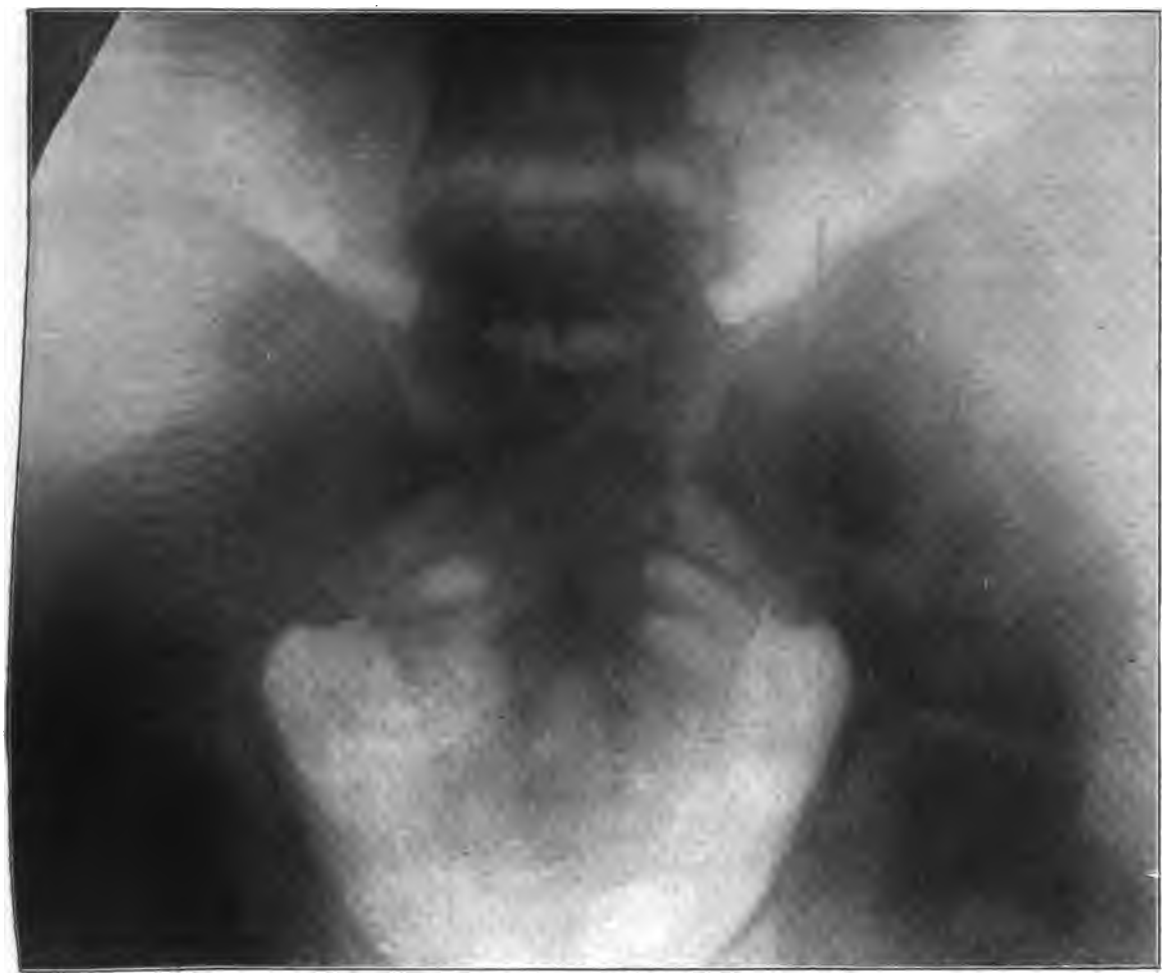

Fig. 3.

A skiagraph of the pelvis showing also the lower lumbar and sacral vertebræ. This skiagraph was of a subject who was injured in a railroad collision and he claimed permanent damage of the bony structure of the pelvis and sued the railroad company for $20,000. Skigraph demonstrated that there was no injury to the bones. After the radiograph was taken and because of it the case was afterward settled for $1,000, showing the use of the X-Ray in medico-legal cases. Time of exposure 3 minutes; tube distance 20 inches.

Until the day of the x-ray the location of foreign bodies in the tissues, such as needles, bullets, particles of steel in the eye, metal buttons and coins lodged in the larynx or respiratory tract, frequently baffled the skill of our most expert surgeons. But now by its use such

filed away as permanent records for future use. Frequently in medico-legal cases has the x-ray proved its usefulness in sustaining or disproving alleged permanent bone injuries, and it has become a valuable adjunct to the legal as well as to the medical profession.

The Railway Surgical Journal

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Subscribers not receiving their Journal regularly will confer a favor by reporting the non-receipt to the editor.

ANNUAL MEETING.

The fifth annual meeting of the American Association of Railway Surgeons will be held in Chicago October 14, 15 and 16, 1908.

HABITUAL DISLOCATION OF THE SHOULDER.

An extreme case of this condition was reported by Martens at a recent meeting of the Berlin Surgical Society. An adult male had dislocated his left shoulder more than 400 times! An operation was finally performed by an incision along the anterior fold of the axilla, an ellipsoid was excised from the capsule and the margins were united by sutures of bronze wire. At the time of report, a year after the operation, there had been no recurrence of the dislocation.

SPLINTS 5,000 YEARS OLD.

In a recent article in the *British Medical Journal,* Prof. G. Elliott Smith describes his examination of two sets of splints which had been applied to fractured limbs about five thousand years ago.

With the exception of flint knives used for circumcision in Egypt in prehistoric times, they are the earliest surgical appliances ever discovered.

Professor Smith had previously described splints found on both forearms of a girl from the early Christian period (perhaps the 7th century), and refers to a fractured patella also set with splints from another early Christian interment.

The first case referred to is one of fracture of the femur (almost exactly in the middle of the bone), in a girl of about 14. The limb was set with four splints passing from just above the fracture to a point well below the knee. Each splint consisted of a rough, slender strip of wood, which had been carefully wrapped up in a linen bandage before being applied. Two had been crudely hewn out, and two were left rough. These splints were held in position by two bandages tied in a reef knot, one above, the other below the knee. A short distance below the site of the fracture was a linen pad about 3 inches long by 1 in thickness, this was discolored by a rust-like stain which was recognized to be blood, owing to the traces of

iron from the hemoglobin. This circumstance together with the fact a piece of bone 2 inches by ½ inch was missing from the back of the shaft at the site of fracture, go to prove it was compound and that the pad was placed on the wound.

"Death," writes Professor Smith, "must have occurred very soon after the damage was inflicted on the limb, for there is no evidence of inflammatory or healing reaction on the broken bone except a very slight roughness on the anterior surface of the lower fragment.

"That these splints must have been quite useless as a support to the broken bone or as a restraint on the tendency of the thigh muscles to shorten the broken limb is obvious at a glance. Their only purpose could have been to fix the knee joint, and by that means to ensure some degree of rest to the damaged member.

The examination of a series of healed fractures of the femur obtained from ancient Egyptian tombs shows—what in fact we might have anticipated from a study of these splints—that as a rule there is a considerable displacement of the fragments, and an excessive development of callus."

In the second case there had been a fracture of both bones of the forearm. This, too, was certainly compound, because there is a pad of blood-stained vegetable fibre still adherent to the upper fragment of the ulna; this was evidently pushed into the wound to stop the bleeding; some of the fibre is sticking to the broken surface of the bone and extends into the medullary canal. A complete tube of splinting invested the damaged limb from an inch below the upper end of the radius down to and including the wrist. This tube consisted of three pieces of rough bark and a bundle of straws of coarse grass. In this case also there was no sign of any healing process.

The author remarks that as regards an effective support to the broken bones, these splints present a marked contrast to those found in the thigh. Dr. Smith, who is professor of anatomy in the Government School of Medicine, has had unusual opportunities for examining bones from the ancient tombs in Egypt and Nubia, and states he has only seen one case of long standing ununited fracture of the ulna; and in spite of the fact a certain proportion of the cases of fracture (always due to direct violence) must have been compound, only one of his series of more than 100 examples shows any signs of suppuration having occurred.

He further points out there is a curious feature common to both sets of splints described, and that is unlike modern surgeons, the old Egyptian instead of using two splints only, endeavored to form a protective casing around the damaged limb to guard it against injury from outside rather than to hold the fragments of bone rigidly in position, and so avoid the greater danger of damage from within.

We are not surprised to learn that some three thousand years later the same splints were found around the forearms of a girl buried in the 7th century, A. D. Nay more, such splints are in use even at the present day, not by the barber-surgeons upon whom many of the inhabitants have to depend for surgical care, but by old women. It seems there are some of these in nearly every village who take upon themselves the care of fractures, and make a kind of mat out of pieces of date-stick (the axis of the leaf of the date-palm) laid side by side, the broken bones are then laid in this so as to form a tubular splint similar to the second one described.

PARALYSIS IN GUNSHOT INJURIES OF THE NERVES.

From the observation of a group of gunshot wounds of the peripheral nerves Henle remarks that in case of paralysis the duration of the affection plays a decisive role. This was but but once as short as 2 months, usually from 3 to 9 months. In all, 29 cases of paralysis occurred; 8 cases recovered without operation; 4 were hopeless; 17 were treated by operation; 3 cases of release of pressure (2 aneurisms, 7 contracted pectoralis minor)—2 cures; 2 cases of neurolysis—1 cure; 8 cases of freshening of nerve-ends and suture—3 cures—*Military Surgeon.*

A knowledge of *inflammation*, the laws by which it is governed, and the relations which its several processes bear to each other, is the keystone to medical and surgical science.—*Travers.*

Notices and Reviews.

Messrs. W. B. Saunders Company, medical publishers, of Philadelphia and London, announce for publication before June 30th a list of books of unusual interest to the profession.

Bandler's Medical Gynecology—Treating exclusively of the medical side of this subject.

Bonney's Tuberculosis.

Volume II, Kelly and Noble's Gynecology and Abdominal Surgery.

Volume IV, Keen's Surgery.

Gant's Constipation and Intestinal Obstruction.

Schamberg's Diseases of the Skin and the Eruptive Fevers.

John C. Da Costa, Jr.'s, Physical Diagnosis.

Todd's Clinical Diagnosis.

Camac's Epoch-Making Contributions in Medicine and Surgery.

All these works will be profusely illustrated with original pictures.

"A Study of the Human Blood-Vessels in Health and Disease" (A Supplement to the Origin of Disease). By Arthur V. Meigs, M. D., Physician to the Pennsylvania Hospital. With 103 Original Illustrations. Philadelphia and London: J. B. Lippincott Company. 1907. Octavo, 140 pages. Cloth, $5.00 net.

It is rather difficult to classify this work, the author tells us it is a supplement to his former work, most of the copies of which were destroyed in a fire at the publishers.

After a preliminary account of the normal vessels the topic of diseases of the blood vessels is taken up, then the changes in the vessels of the heart, lungs, liver, and other organs are described from the author's researches. This part of the work consists in the main of descriptions of the specimens collected by the author. Meigs asserts that apoplexy is preceded by ulceration of the intima, that he has found this in several cases and in some has even demonstrated the aperture through the area of ulceration.

The illustrations, over 100 in number, are very elaborate. The author hopes his studies of the vessels in various diseases may be of use in the further study of such diseases. It seems to us the work will be of value, even though it does nothing more than to make one think about the older ideas of disease. R. B. PREBLE.

Personal.

Dr. David LaCount, Wausau, Wis., local surgeon for the Chicago, Milwaukee & St Paul and Chicago & Northwestern Railways, died April 12, aged 79.

Dr. John B. Murphy has resigned as professor of surgery and co-head of the department in Rush Medical College, and has accepted the professorship of surgery and head of the department, in Northwestern University Medical School.

The National Volunteer Emergency Service, instituted in 1900, has recently been reorganized by the election of Dr. James Evelyn Pilcher, the distinguished editor of *The Military Surgeon*, as its Director General, and Dr. F. Elbert Davis, of New York, as its Adjutant General. Its work will be conducted along military lines, the details being worked out in three separate corps, a First Aid Corps, a Public Health Corps, and a Medical Corps—the latter consisting of physicians, with rank from Lieutenant to Colonel, according to length of service, to whom are afforded special opportunities for emergency training. It includes among its personnel a large number of notable personages, and is rapidly extending its membership throughout the country. Full details regarding the service and its great work may be obtained by addressing Director General Pilcher at Carlisle, Pa.

FRISCO RAILWAY SURGEONS' ASSOCIATION.

The following officers were elected at the last annual meeting:

President—Dr. W. A. Duringer, Ft. Worth, Texas.

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The next meeting will be held in Kansas City, Mo., May 25, 26, 1909.

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We meet with many cases in practice suffering intensely from pain, where because of an idiosyncrasy or some other reason it is not advisable to give morphin or opium by the mouth, or morphin hypodermically, but frequently these very cases take kindly to codeia, and when assisted by antikamnia its action is all that could be desired. In the grinding pains which precede and follow labor, and the uterine contractions which often lead to abortion, in tic douloureux, brachialagia, cardialgia, gastralgia, hepatalgia, nephralgia and dysmenorrhea, immediate relief is afforded by the use of this combination, and the relief is not merely temporary and palliative, but in very many cases curative. The most available form in which to exhibit these remedies is in antikamnia and codein tablets.

The physician cannot be too careful in the selection of the kind of codeia he administers. The manufacturers of antikamnia and codein tablets guarantee the purity of every grain of codeia which enters into their tablets. This not only prevents habit and the consequent irritation which follows the use of impure codeia, but it does away with constipation or any other untoward effect.

Dr. M. Steiner writes from the Ducal Hospital and Sanitarium at Altenburg that a remedy for influenza must meet three requirements: (1) It must effect subjective improvement, *i. e.*, depress temperature and relieve pains; (2) must be innocuous; and (3) must as far as possible prevent complications. He applies these tests to pyrenol, which has lately been recommended for influenza in about thirty publications.

That pyrenol is antipyretic and analgesic must be conceded. Thus reports from the Augusta Hospital (Berlin) and the General Hospital (Vienna) show that its antithermic effect is slow and steady, accompanied by subjective betterment; there is no exhausting diaphoresis under its use, as there is with antipyretics, which act suddenly and rapidly.

As to innocuousness, hardly a single writer fails to record the improvement in the appetite and the general absence of gastrointestinal disturbances under its use. The sphygmometric experiments of Cowl showed total absence of any untoward action; to the contrary, the drug is a cardiotonic,—a most valuable property in influenza. Nor does pyrenol ever irritate the kidneys.

Steiner's own observations with pyrenol began in 1903, were especially numerous in the epidemic of 1904-5, and were confirmed in the autumns of 1905 and 1906. He has records of 86 cases treated with pyrenol and 20 control cases which got other treatment.

Cases in the prodromal stage of influenza took 15 grains pyrenol, *t. i. d.*, or 7½ grains six

times daily; when the patient could not swallow tablets, 5% solution was given. If symptoms were already well developed and severe the dose was 15 grains four times daily or half the dose every three hours, given until the first signs of improvement occurred, and then reduced to 45 grains daily, and continued till he got out of bed. Cardiac lesions, nephritis or liver trouble were no contra-indications.

The third test of pyrenol is the absence of complications. Of the patients seen in the prodromal stage the great majority remained under treatment only for from a few days to a week; and not one developed pneumonia. In almost all pyrenol was the only treatment required. In the first two days large hot compresses were applied for two hours twice daily to the trunk to promote diaphoresis, and pyrenol seemed to do especially well under this treatment. Vigorous rubbing of the body after the sweating seemed to put the patient in good condition for some hours.

Of the patients seen only when the malady was already advanced, pneumonia was positively diagnosed in eight. The dose of pyrenol was usually increased by 15 grains daily, to control fever and pain more rapidly. There was not a single death. As temperature and pulse were kept in moderate bounds the subjective symptoms were bearable and the course of the disease was very favorably modified.

Cough during the febrile stage was treated exclusively with pyrenol.

Pyrenol was very helpful in the influenza of children. In young subjects almost all antipyretics, even in small doses, are apt to depress the temperature to subnormal, with collapse lasting perhaps for hours; so we are glad to have a remedy which slowly and gradually lessens the fever and does not depress the heart. Children from 6 months to 8 years got, in accordance with age, one or two teaspoonfuls of a 2% to 4% pyrenol solution in raspberry syrup, three or four times a day. Its antifebrile action lasted longer in children than in adults, so less frequent administrations were necessary.

To conclude: Pyrenol in influenza depresses the fever gently and gradually, with very light sweating and an increase in the general well-being. It relieves the pains in the joints, muscles, tendons and fasciæ, as well as those of the pleural and intercostal nerves. It is a powerful expectorant, loosening the mucus and diminishing secretion.

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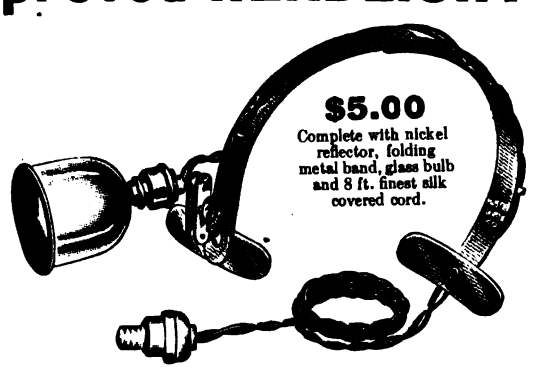

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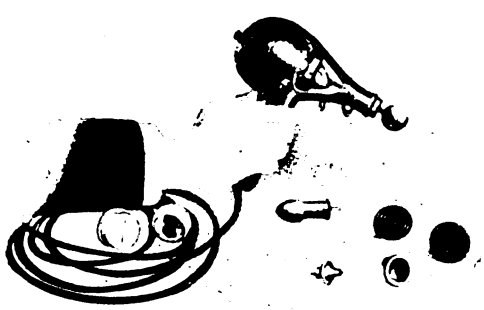

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THE RAILWAY SURGEON AND RAILWAY SANITATION.*

BY H. M. BRACKEN, M. D., ST. PAUL, MINN.
Secretary and Executive Officer Minnesota State Board of Health.

It is possible that the general railway surgeon will feet it is outside of his province to interest himself in the general sanitary problems connected with railways. I realize that surgeons are busy men, and are always burdened to the limit with affairs outside of their special line of work. Nevertheless, if sanitary affairs connected with railways are to receive any attention from the medical profession it must be through railway surgeons at the present time, for there are but few sanitarians who are sufficiently in touch with railroad work to permit of their accomplishing any great good along these lines. It is hardly to be expected at present that railway companies will pay any great amount for sanitary services rendered, although in many instances such an expenditure would be a matter of economy. If, therefore, anything is to be accomplished along the lines of railway sanitation it will be due largely to professional pride on the part of railway surgeons rather than to any obligation on their part.

An elaborate sanitary inspection by railway surgeons can hardly be expected under such conditions, but a passing word from a resident railway surgeon, with suggestions as to the necessary changes in order to improve certain sanitary conditions, local or general, may be of great service to those who are at present responsible for railway sanitary affairs. It is my experience that railway officials are ready to listen to reasonable suggestions.

Railway sanitary problems may be divided into local and general. The first come under the observation of every railway surgeon in his home town. The second come within his notice as he travels. Prominent among the local conditions are those in and about every railway station. These involve the proper construction and care of the station itself; the condition of the waiting rooms, of the toilet rooms, and of the station platforms, the appearance of the station grounds, the condition of the shipping pens, the care of vaults, a proper drinking water and ice supply, etc.

As railways prosper they replace their barn-like wooden station buildings with artistic structures. It is surprising to note the amount of money that is often wasted on unnecessary decorations in these modern buildings, while the important, but inexpensive, sanitary essentials are left out of consideration. It is by no means an uncommon thing to find a station which presents a showy appearance, with toilet rooms that have little if any outside light.

On a recent short trip of inspection I went into several stations located along the line of a prominent railway where it was necessary in

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

midday to strike a match in order to note the condition of the floors of the toilet rooms. Of course such rooms were often dirty, partly because passengers using them were careless and partly because those having charge of these dark rooms did not consider it necessary to clean out the dirt that was concealed by the darkness. These conditions were primarily due to the inexcusable negligence of the architect or architects who designed the stations, for in most instances the toilet rooms were against the outside wall of the building (as they should be), but the windows were too small or too high up in the wall, or darkened by artistic overhanging roofs or by stained glass windows. In the rooms for men the closet seats were unfit for use, and the odors had free access into the men's waiting rooms. Such conditions brought to the attention of the proper railway officials should insure to the architect responsible for same the loss of any further work for that company.

Not enough attention is given to the cleansing of toilet rooms. Not long ago my attention was drawn to the fact that in a new and beautiful little station in a city with a population of 9,000, the ladies' toilet room showed evidence of not being properly cared for.

It is a fact that the ordinary station waiting room is unattractive the year around. In winter it is stuffy and ill-smelling, often due in part to the condition of the closets referred to above. In the summer it is the home of flies. It follows that in winter or summer the passenger who has to wait for any considerable length of time at such a station is restless, and, if an able-bodied man or woman, is constantly going out of the room for a change of air, or a rest from the annoying flies. Such conditions tend to make the traveler irritable, and the criticisms passed upon the road that may be unavoidably annoyed with late train, are intensified by the unsanitary conditions in the station.

More attention should be given to the cleanliness of stations. Not long ago I was waiting for a train in a well-built station located in a city with a population of 10,000. The room was dirty, with the refuse of lunches, etc., of the previous day. While waiting, a man came in and began to dry-sweep the room with a long-handled brush. Of course the dust was unbearable, and the only thing for those who were waiting in the room to do was to go out and promenade on the platform until the sweeping was over, for there were no outside seats. This room should have been swept the night before or early in the morning before passengers began to use it. It should not have been dry-swept at any time. It would have been taken care of better and more cheaply by a woman than by a man.

It is no uncommon thing to find in both the men's waiting rooms and the women's waiting rooms in very respectably equipped stations, after 10 o'clock at night, loafers and tramps stretched out on the floor, sleeping and snoring away and making the atmosphere of the room vile. The same conditions often prevail during the early morning hours. There is no excuse for this. Railway stations should not be used as lodging houses.

Smoking is sometimes permitted in a general waiting room after 10 p. m. This is an inexcusable violation of sanitary requirements. If a railway company wishes to keep a waiting room fit for its women patrons, it should not allow it to be used as a smoking room at night. Possibly the railway officials do not allow such action, but the railway agents do.

The vaults at a station often become filled to the limit. It is not necessary to dilate on the results of such conditions further than to say that the closets and waiting rooms at such stations are offensive and the odors outside the station disagreeable. Still further, at such places the swarms of flies in summer make both the station waiting rooms and platforms very unattractive.

The appearance of the grounds about a station may not be of great sanitary importance. It may matter little from the sanitary point of view whether the station is surrounded by uncared-for grounds so long as the garbage is cleared away. But a station having for its environment some green grass, a few shrubs, and an occasional flower, has a great advantage from a sanitary point of view over an ill-kept place, for the loafers who always assemble about stations are less disposed to indulge their filthy habits; and should they do so, the tendency for

some one to call a halt on such proceedings would be greater at a well-kept than at an ill-kept station. Railway station esthetics, civic pride and improved sanitary surroundings are apt to go hand in hand.

A railway surgeon may not think it necessary to interest himself in shipping pens, but why should he not if they are in his home town? He is a citizen as well as a surgeon. Shipping pens often become extremely offensive. The railway surgeon may say that it is the duty of the local health officer to look after such matters. True, but the local health officer may be inefficient, or he may not know how to bring about a change. My experience leads me to believe that railway officials do not wish their property to become a public nuisance, but local railway employees are sometimes lax and negligent. The local health officer may order the local agent to have the shipping pens cleaned up. The local agent dilly-dallies; the local health officer splutters, but accomplishes nothing. If the attention of the proper railway official is drawn to the matter, the pens will be cleaned promptly. The local surgeon knows how to reach such official directly or indirectly. The local health officer may not have such knowledge, or ability, to reach him if he has the knowledge. Railway officials know that it is to the financial advantage of their roads, especially where there is competition, to avoid disagreeable quarrels with municipalities.

In certain states, sanitary regulations are being passed bearing upon the cleanliness and care of stations and their surroundings. Spitting regulations are posted; instructions are given in the construction and care of water receptacles and in the choice of water and ice supplies. These state sanitary regulations can be made most efficient where the citizens of a municipality take an interest in their enforcement. Who should be more interested in such matters than the resident medical man representing one or more railways?

The railway surgeon's duties as a sanitarian do not end with the sanitary responsibilities of the road which he repesents, in his home town. He should keep his eyes open when traveling and note some of the general sanitary conditions confronting the various railways,—the proper cleaning of cars at terminal stations, the proper care of cars in service, the proper heating, lighting and ventilating of cars, due precautions in the selection and protection of drinking water and ice for use in cars, suitable drinking receptacles, etc. All of these should interest the railway surgeon as well as the general traveler. The traveler looks at such matters purely from the standpoint of a critic. The railway surgeon should look at such matters from the company's point of view as well as from a critic's standpoint. He should consider possible points of improvement that would be an advantage to the road which he represents. He knows stuffy and overheated cars in winter, and dusty, dirty cars in summer, do not advance the financial interests of the company operating them. He knows that drinking water, if not of good quality, may be a cause of disease; that drinking cups used in common in cars may be a means of transmitting such diseases as syphilis, diphtheria, tuberculosis, etc., and that it is an open question whether the use of such cups in cars should not be discontinued. He knows that typhoid excreta scattered along the railroad is a possible source of danger. He knows that car cleaning at terminals should be properly done, and that cars when they start out should be fresh and free from the odors of the toilet closets—a condition which is by no means as general as it should be, even in our best cars. He knows that the dry-sweeping of cars, while in service, should not be permitted.

Let him put this knowledge to good use. If the road with which he is connected has a sanitary representative, let him bring these matters before such representative with his suggestions. I understand that certain surgeons of the Rock Island system have made sanitary inspections and suggestions to the chief surgeon of the road. Let more of this be done. It will be to the interests of the road which you represent as well as to your own interests. It is too much to expect a man who may be labeled "Sanitarian" to a given road to bear alone the sanitary burdens. If he is compelled constantly to file his personal criticisms he may be called a "crank" or a "kicker," while if he has the support of his professional colleagues his advice

or suggestions become less personal and more effective.

Bearing upon the possibility of infection, the following taken from the Michigan *Public Health* (Sept., 1906, p. 44), is apropos:

"We are told that in the year 1905 there were used in these United States 700 million railway tickets, and that these tickets called for 2 billion miles of travel. As there are approximately 200,000 miles of railway in this country, this would average about 30 miles per ticket, or 90,000 persons per year over each mile of railway in use.

A contemplation of these figures, together with the sanitary conditions which prevail on our passenger coaches, will reveal a danger to public health which should attract the attention of our legislators and cause laws to be enacted which will, measurably at least, correct the conditions and make travel as well as a residence along these public highways less dangerous.

If each passenger will excrete on an average from the intestines ½ pound per day, and of urine 50 oz., we will have deposited on the narrow rail strip in one year 45,000 pounds, or twenty-two and one-half tons of human excrement and 4,500,000 ounces of urine, or 35,156 gallons, for there is at present no contrivance to carry this to where it may be incinerated or disinfected. It is dumped onto the ground—this narrow strip of 5 feet 7 inches, there allowed to dry and thrown into the air by the rapid motion of the car, to be breathed by the passengers or those residing near the railroad. All this, besides the sputum which is so freely deposited along our highways directly from the person along this narrow strip, or from the contents of the cuspidor which the employe of the road dumps through the toilet. We realize that many diseases may be communicated to individuals who inhale this excreta. * * * While we are making our demands for clean cars and better ventilation, let the medical profession and sanitarians agitate the question of disposing in some proper manner of this excreta, for it is much more dangerous and abhorrent than is the poorly ventilated or illy-dusted car. We believe that the average road will be willing to abate so great a nuisance if some favorable plan can be suggested. Cylinders might be constructed of paper or wood pulp to hold, say, 40 gallons, and one carried at each end of the car where the toilet is located. These could be detached at the end of the daily trips and the whole, cylinder and contents, incinerated in a plant for the purpose and conveniently placed. A trap could be constructed which would allow of the reception into the cylinder of whatever was thrown into it, and automatically closed, thus also preventing the very objectionable odor which always prevails in these toilets. Receptacles for sputum should be conveniently placed in all cars and the passengers educated to use them instead of the floor or spitting through the car window.

The following from the Bulletin of the Health Department, Chicago, November 17, 1906, also has a bearing upon railway sanitation:

"Bacteriologic examinations of the air of the street cars made by the laboratory disclosed the fact that in 146 examinations the number of bacteria in cars, with all the seats occupied, averaged four times more than the number in the outside air. In the cars that were crowded by strap hangers during the rush hours in the morning and evening, the number of bacteria showed an increase equal to 26 times that of the same car when only the seats were occupied by passengers.

"In an examination of sputa collected from the floors and platforms of the cars, tubercle bacilli were found 4 times, influenza bacilli 12 times, and pneumococci 9 times out of 17 examinations—some of these specimens containing both of the latter organisms. No effort by conductors to prevent spitting in the cars was observed during these examinations."

Finally, I wish to draw your attention to certain regulations relating to railway sanitation that have recently been adopted in Minnesota. These cover but a small proportion of the railway sanitary problems, but they represent a beginning. They have the endorsement and support of the railway officials representing the various roads operated in Minnesota. I hope these regulations, or others similar in type, may be put into effect in other states; and that all railway surgeons in Minnesota, or in other states having sanitary regulations in force, will do everything in their power to assist in the enforcement of the same, both in the interests of the road which they represent and of the traveling public. The Minnesota regulations are as follows:

REGULATIONS ADOPTED BY THE MINNESOTA STATE BOARD OF HEALTH, 1907.

Relating to Car Sanitation.

129. No person shall spit upon the floor, furnishings or equipment of any railway coach, chair car, parlor car, sleeping or dining car, depot or depot platform, in the State of Minnesota.

The Minnesota State Board of Health will furnish, at the expense of the state, upon request, and each railway company operating in the State of Minnesota is hereby required to post and display in each passenger coach, a placard in form as follows:

SPITTING OR THROWING OF REFUSE ON THE FLOOR, FURNISHINGS OR VESTIBULES OF THIS CAR IS PROHIBITED BY LAW.

The following notice must be posted in all station waiting rooms located in Minnesota:

SPITTING OR THROWING OF REFUSE ON THE FLOOR, FURNISHINGS OR VESTIBULES OF CARS OPERATED FROM THIS STATION IS PROHIBITED BY LAW.

The following notice must also be posted in all station waiting rooms located in Minnesota:

SPITTING OR THROWING OF REFUSE ON THE FLOOR OR FURNISHINGS OF THIS ROOM IS PROHIBITED BY LAW.

The notice posted in station waiting rooms located in Minnesota must be signed by the Secretary and Executive Officer of the Minnesota State Board of Health.

130. The owners of all general waiting rooms and smoking rooms shall provide one or more spittoons for each of such rooms. All spittoons must be placed upon the floor. Water must be kept in all spittoons except those used in cars.

131. Spittoons must be placed in the offices used by railway officials and employees.

132. Should a passenger be found spitting upon the floor, his or her attention should be drawn to the regulation poster in the car prohibiting spitting. Should it be impossible for the passenger to refrain from spitting because of disease or other infirmity, the porter in charge of the car shall provide such passenger with a spittoon.

Each sleeping car operated in Minnesota shall be furnished with one (1) spittoon for each section or compartment. Each smoking compartment in day coaches, chair, parlor and sleeping cars, must be furnished with at least two (2) spittoons. Each smoking car shall be provided with at least six (6) spittoons. Each combination smoking car shall be provided with at least four (4) spittoons.

133. Spittoons, as directed in the preceding rules, must conform to the following requirements: They must be of such form as to meet with the approval of the Minnesota State Board of Health, and so constructed as to conceal their contents from view so far as possible, and permit of their being easily and quickly emptied and cleaned. They must be of such shape that it is easy to spit into them.

134. Spittoons must be cleaned at least once each day.

135. When a water-borne disease has developed in epidemic form in a municipality, water from such a place for car tanks shall not be used without the approval of the Minnesota State Board of Health. The drinking water and ice supply used in day coaches, chair, parlor, dining and sleeping cars, must contain no ingredient deleterious to health. In new passenger cars all receptacles for drinking water must be so constructed that they cannot be opened by any one except those having charge of same.

Nothing but ice and water shall be placed in the receptacles used for the storage of drinking water.

136. All day coaches must be thoroughly cleaned once each day or at the end of a trip. In no case shall such cleaning be less frequently performed than on every third day. There shall be no dry sweeping or dusting of cars while in service.

The thorough cleaning of day coaches must be carried out as follows:

The floors shall be cleaned with soap and water, to which may be added any other cleansing agent. After being cleaned, the floors shall be mopped with a 1 per cent solution of the official formaldehyd solution (U. S. P. 1900), or some other disinfectant approved by the Minnesota State Board of Health. The walls in the closets shall be cleaned by sweeping and wiping with a disinfecting solution. The hoppers and urinals shall be thoroughly cleaned and disinfected. The floors of the closets shall be thoroughly cleaned. After the above preliminary cleaning the hoppers and urinals and closet floors shall be mopped with a 1 to 2 per cent solution of said formaldehyd solution, or some other disinfectant approved by said State Board of Health.

The receptacles for drinking water shall be emptied and thoroughly cleaned as often as necessary.

137. A day coach in which a person affected with smallpox, scarlet fever or diphtheria, has been carried must be closed as soon as the passengers have left the car, and remain closed and unoccupied until the coach has been thoroughly disinfected with formaldehyd gas, using not less than ten (10) ounces of the said formaldehyd solution for each 1,000 cubic feet of space to be disinfected. If the potassium-permanganate method is used, then there must be twenty (20) ounces of the said formaldehyd solution and sixteen (16) ounces of potassium

permanganate used for each 1,000 cubic feet of space to be disinfected. After a thorough disinfection of the car, it shall be cleaned as directed under Rule 136.

138. Upon arrival at cleaning terminals, sleeping cars shall be cleaned as follows:

The windows, doors and ventilators shall be opened, the upper berths let down, the seat bottoms and backs lifted out, the mattresses, blankets, pillows, curtains, etc., loosely arranged for airing. If the weather permits, the removable articles mentioned above shall be taken out of the car, dusted and aired in the open, and exposed to sunlight for a time. The rest of the cleaning of the car shall be carried out as directed for day coaches under Rule 136.

139. Sleeping cars shall be fumigated at least once every two months. Fumigation shall be carried out before the carpets have been removed or the cleaning of the car begun. Preparation for fumigation shall be as follows:

Close all outside doors, windows, deck sash and ventilators. Arrange one or more windows on each side of the car so that they can be opened from the outside to avoid the necessity of entering the car while the formaldehyd fumes are strong. Open all interior doors. Pull the seats forward and loosen the pillows in the pillow boxes. Open the upper berths and lay the head boards across the seats so that one corner will rest upon the seat arm. Lay the lower mattresses on the head boards with the middle arched upwards, the ends being pushed together. Raise the curtain poles and hang the curtains near the end by a single hook. Throw the blankets over the curtain poles, making as few folds or thicknesses of the blanket as possible. Arch the upper mattresses in the upper berths.

Fumigation with formaldehyd solution and potassium permanganate shall be carried out along the lines approved by the Minnesota State Board of Health. After the car has been fumigated it must remain closed for a period of at least three (3) hours, after which time the doors and windows shall be opened as soon as possible. On rainy or damp days the car need not be kept closed after fumigation for a longer period than one hour.

140. Porters shall not sleep in sleeping cars in Minnesota unless a special compartment in the sleeper and special bedding are provided for their use by the companies operating the same.

141. Porters shall not use the sleeping car bedding provided for passengers.

142. Parlor, buffet and dining cars shall be cleaned each day, or at the end of each trip, as directed for the cleaning of day coaches under Rule 136.

Food boxes, refrigerators, lockers, drawers and cupboards shall be thoroughly cleaned and treated with a 1 per cent solution of the aforesaid formaldehyd solution as often as necessary, and shall at all times be kept sweet and clean.

143. All toilet rooms, water closets, urinals and toilet appliances in stations shall be cleaned daily, and when vaults or surface receptacles are used in connection with closets in stations, such vaults or surface repectacles shall receive a daily treatment with fresh lime or other agent approved by the Minnesota State Board of Health. Toilet rooms and closets shall be made fly-proof by means of screens on windows or other outside openings.

DISCUSSION.

Dr. F. H. Staley, Clear Lake, S. D.: It may seem presumptuous for a man from a remote little town from the distant state of South Dakota to attempt a discussion on sanitary matters following a paper by so able a man, and a man so well known for his connection with sanitary work throughout the country as is Dr. Bracken. But I have given some thought to this matter, probably more than a great many have.

I will tell you how it came that I have thought this matter over. Last June I was called to see a young Scandinavian who had arrived in our community the Monday preceding the Wednesday upon which I was called to see him, and he gave about this history: He He left quarantine station, Nova Scotia, on Friday, feeling sick, thinking he had a cold. There probably was nothing to be seen then or the quarantine officers would have detected it. He started on his way to Dakota, and he kept getting sicker and sicker until the time that he arrived at his destination, when he was a very sick man, but he and his friends still thought that it was a very severe cold and nothing more, and they called no one until Wednesday, when I was called. I went and I found that poor fellow practically moribund with diphtheria of a malignant form, the nasal and pharyngeal mucous membranes covered with the diphtheritic deposit, the voice a mere whisper, showing that the larynx also was involved. The system was thoroughly saturated with the poison, and he died in less than 24 hours. This incident set me to thinking that I should just like to be able to go back and see what re-

sulted from that man's trip from Nova Scotia to South Dakota. On the way he had stopped over at Watertown from Saturday, or from Sunday morning until Monday morning, as he could get no train out, stopping there at a hotel. And as I thought of that, I thought of other ways in which the railway undoubtedly acts as a factor in the spread of disease.

We know that our railway companies are constantly aiming to safeguard the lives of their employes and of their passengers. They aim to employ only efficient men; they have the highest type of locomotives and of coaches; they have their block systems, and they have everything that they can think of to do away with sources of danger. But, nevertheless, once in a while we are horrified to read of some terrible accident, scores of lives crushed out and scores more injured, and at the end of the year we will see a statement in the newspapers that during the past year so many thousands of people in the United States have lost their lives in railway accidents, and so many tens of thousands injured. But after I got to thinking along that line I wondered if it might not be possible, if we could trace back the causes of sickness that originate directly from railway travel, or which are carried by people who have been traveling by railway to the homes which such people have visited, or if it were possible to collect those statistics and get the number who are made sick, and the number who lose their lives, whether the loss of time and the loss of life would not be just about as alarming from these latter causes as from the happening of these terrible accidents.

As Dr. Bracken has suggested, there are many ways in which conditions might be improved. In the first place, in the case of the young man, was it necessary that he should travel all the way from Nova Scotia to South Dakota and nothing be known as to his condition? He must have been a desperately sick man, so much so as to be apparent to anyone who was at all observant. It seems to me that the men in charge of that train should have had instructions from somewhere that in case a man appeared to be extremely sick, that is was entirely within the range of the work of the local surgeon to come upon telegraphic request and examine that man. The disease was undoubtedly in evidence a very short time after the young man left Nova Scotia, and if it had been detected and the patient removed from the train, scores and possibly hundreds of people would have been saved from exposure to the contagion from this person. I do not know whether any such arrangement exists or not, but it seems to me it would be entirely practicable for the men in charge of a train in case of sickness to call a local surgeon to meet the train at the station when it arrives and examine the person, and if there be occasion, to remove him from the train and not expose others.

As to the matter of drinking cups, which Dr. Bracken has brought out, there can be no question but what syphilis, diphtheria, scarlet fever and typhoid may be scattered broadcast over the country by the drinking cups on railway coaches. This is a pretty hard question to solve. The only thing which suggests itself to my mind is that there might be a cheap cup devised, made from paper or pulp of some kind, to be used and thrown away. They could be nested and put where passengers could get them, and in that way after one person used a cup nobody else would drink from it. As to the disposal of excreta, I think that Dr. Bracken's paper mentions a wooden receptacle to be placed under the car to receive all the discharges from the closet, and there to be carried until a terminal point is reached, where it should be burned. That ought to do away with that difficulty. Or it might be possible to have a disinfectant strong enough, connected with the trap, so as the trap is dumped the solution would run in and remain until dumped again, and so on.

In the matter of yards, we had a case of that in our own town. The stock yards became a source of—well, at least a nuisance, and possibly a source of danger. The refuse had been allowed to accumulate there for months. We had had excessive rains and hot suns and the stench was something almost unbearable. The citizens bickered back and forth with the local employes of the company, and the matter was brought to me as the health officer of that county. I did not issue any order; I simply wrote a polite letter to the division superin-

tendent at Estherville, telling him the condition of affairs. I did not order him to have it cleaned; I simply called his attention to it. I found, as Dr. Bracken has said, that the officials are ready to listen to reasonable suggestions. He wrote me back a very courteous reply, and in a very short time the cause of annoyance was removed and everything was satisfactory all around.

Another point that has come to my mind is the material of the upholstering in cars. Almost universally we find plush, especially in the better class of cars. I presume the railway constructors have their reasons for using plush, probably it is a matter of comfort to the patrons, but it has struck me that they could use nothing which is more likely to catch germs and retain them than the plush. Leather could be more easily cleaned, it would not catch as many germs in the first place and would be more easily rid of those which it did catch.

Upon reflection it will be found there are dozens of ways in which railways may and undoubtedly do, spread disease over the country, and I think the little local man like myself can help in all these things by observing conditions at his own station. If he is at a station where water is supplied to coaches and there is any water-borne disease, such as typhoid, prevalent in that town, he can notify the officials. It seems to me that all water and all ice should be examined by an expert at very short intervals, whether there is any water-borne disease prevalent in the town supplying the water or not. It seems to me it would be nothing more than right that the companies should do that.

Dr. J. E. Minney, Topeka, Kan.: Sometimes we stick up a bogey man to knock him down. But I feel that Dr. Bracken can answer this question for us. This strip of land, 5 feet 7 inches wide—the railroad track—receiving this immense amount of detritus poisons, as we say, is there any way by which we can learn whether that does spread disease? What are the vital statistics of the section men who work on the road? What are the statistics respecting their health, respecting their life, whether there is a greater mortality considering their work, considering their exposed condition along the track?

Second, what are the statistics of porters, brakemen and conductors on the railroads as compared with passengers? But we must take into consideration their exposure, which is a great deal more than it is with the ordinary citizen, and if the mortality is greater we may expect it. Again, what are the statistics of livery stable men who have this ammoniacal odor to smell all the time, as compared with the average citizen, considering again their exposure in their business?

Again, take the smoker; what are the statistics respecting those individuals who ride in smokers in preference to riding on the other cars? Is it any greater? I am not taking the side of filth, but I want these questions answered, and I feel that the doctor can answer them for us. If answered in the affirmative, then of course we admit that the railroad tracks are these great sources of danger to the individuals who work on those tracks. So far as carrying disease from one section to another, that is done on the train, by the passengers, in the main.

Dr. Charles D. Thomas, Peoria, Ill.: The doctor has called attention to the matter of regulations regarding spitting. We are hearing a great deal of this all the time now, especially in larger cities—expectoration on the sidewalks and some of the European resorts, there are health resorts—I don't know how it is down at Colorado Springs and Manitou, but in Meran and some of the European resorts, there are very strict regulations about expectorating by the patients in those resorts. That only goes to show the profession generally has come to the probably scientific, proper conclusion that there is danger in promiscuous expectorating. As we travel along the trains we see people hawk and spit and expectorate in the car on the floor. I think every decent person is repulsed and disgusted by anything of the kind. It seems as if a person who has been raised in the society of the present day should know better. Unfortunately, however, you as the local surgeon, perhaps, even as the surgeon in chief, have no power to prevent it—at least if you do remonstrate—the man only comes back at you with some unpleasant remark, and you really haven't gained much of anything. But you are never-

theless impelled each time you see anything of this to remonstrate with the man and advise him that that is a dangerous thing. If he comes back at you you hardly have the possibility of doing anything to him. It seems as though there should be some regulation about a matter of this kind, and as if the local surgeon or the authorities on the train should have the power to proceed legally in the matter: the law prohibiting it and the railway company requiring the conductor to eject the offender or take his name and address. But I do not know whether such a thing could be regulated.

I also think that physicians themselves ought to look to this matter a little bit with regard to themselves. Now it is not impossible at times to see physicians themselves disregarding the laws in this matter, that is, the laws of decency and of society, perhaps even in this assembly. I am glad to see these cuspidors have been brought in this afternoon, but this forenoon I saw a physician expectorate right on the floor. It occurred to me then that if physicians expect to pose as the regulators and sponsors of the public in a matter of this kind they first ought to begin with their regulations at home.

People will say lots of times, "There are no cuspidors, there are no accommodations made for people to expectorate in cars, in an assemblage, or wherever they are." But that is a mistaken idea. One's handkerchief is made for expectorating in just the same as for blowing the nose. There are people who seem never to grasp that idea at all, and I think physicians ought to make an effort to set a perfect example themselves; and then, if possible, it seems to me that something could be done to have some convenient place provided in the cars. There are such conveniences in the little stations that we go into, our local stations, but there are no accommodations on all trains, except, perhaps in the Pullman or parlor cars. In the smokers there are no accommodations in the way of cuspidors for expectorating, and until the company furnishes accommodations of that kind, of course, the physicians of the railroads and the people can't do very much.

Dr. S. C. Plummer, Chicago: I was interested, immediately after Dr. Bracken's paper suggesting what a local surgeon *could* do, to have so good an example of it in Dr. Staley, who showed what a local surgeon *can* do.

I want to say that I appreciate this kind of interest taken by local surgeons. I have to thank quite a number of you for writing me in regard to sanitary conditions which you have observed. Of course, I have no power to carry out these recommendations. That part of it I have to turn over to some one else. Letters of that sort I have always referred to the general manager's office, and I hope you see results from your reports. I don't know whether you do or not. I would be very glad, if after you have sent in a letter suggesting to me any sanitary matter, you would let me know whether the improvement has come about. In some cases I know it has, I have had letters saying that the suggested improvement has been made, but I would like to know in all cases.

I want to say that I do not want any of you to imagine that I am bored by these letters. I am not, and I do not think the management is bored by them. I think, on the contrary, that we both are pleased to get these suggestions, and I want to see them carried out, and I think the management also wishes to co-operate. Of course by the time it gets down to the man who is to actually remove the difficulty, the good intention may get lost. I imagine that the general manager refers the matter to the general superintendent, the general superintendent refers it to the division superintendent and then I don't know to whom he refers it. But if it does get lost before the result comes I would be very glad to be informed of it.

Dr. Bracken (closing): I can only say I am pleased that the paper aroused some discussion, and I will close as briefly as possible.

First, in reference to Dr. Staley's remarks on drinking cups: There are cheap paper cups, and it is a question whether the passenger should buy their own cups or whether the railroads should furnish them. I have discussed this with railroad men, and if there is any feasible way of meeting the conditions the railroad men are ready to do it. It is thought that there might be something like a penny in the slot arrangement in the car so that by dropping

a penny in you could get a drinking cup out—a little paper drinking cup. The solving of the drinking question is largely, however, in the education of people to carry their own cups. Of course many people do this now. You will see even the poorer people take out their own cups, their own glass, or something of that kind if they are traveling for some distance, and I think if the the railroad surgeons would back up the railroad men they would simply stop supplying drinking cups in their cars. I have discussed this with the managers of the railroads running into Minnesota, and they are willing to do it if they only have public sentiment back of them. The people should know that if the cups are cut out of cars it is for their own good.

Dr. Staley referred to the possibility of disinfecting stools; that I would say is a practical impossibility on cars. It is difficult, at best, to disinfect stools properly. I want to say right here that I object to the use of disinfectants or so-called disinfectants in the toilet rooms of cars, thus simply substituting one stink for another.

As to upholstering, I was glad Dr. Staley referred to this. The very point that Dr. Staley brought out against plush, namely that it holds the dust, has been used in its favor. Dust will not stay on the leather, it simply falls or slides off, and it is constantly in motion while dust on the plush settles into it and stays there. This is the argument put forward for plush by a railway representative.

Dr. Minney asks for statistics: There is nothing more difficult than to secure statistics on the spread of disease by railroads.

Dr. S. C. Plummer: I would like to suggest that if Dr. Bracken wishes to learn about the health of section men he can learn through our local surgeons on the Choctaw division where they have a hospital association. These men when sick go to our local surgeons. That does not apply to the rest of the lines, but it does to the Choctaw division, and I am sure our surgeons there would be glad to furnish Dr. Bracken with the information that he is asked for, and in that way get some reliable statistics as to the health of section men.

VARICOSE ULCERS — TRAUMATISM AS AN EXCITING CAUSE AND THEIR TREATMENT.*

H. E. CAMPBELL, M. D., ANITA, IOWA.
Local Surgeon.

I do not know or expect that I can offer anything really new, yet cannot but believe from frequent observation and experience that many suffering and sometimes almost helpless individuals might be either permanently cured or made able to pursue their different avocations with comfort were surgeons and physicians inclined to devote much thought, care and attention to the management of these cases.

Few diseases or diseased conditions give to the old man or woman so much pain, annoyance and grief, especially the man or woman who has to do heavy work and standing on their feet to make a living, as varicose conditions of the veins of the lower extremities, and varicose ulcers. The average man or woman who has reached the age of 50 and has had to labor or perform work of any kind that requires much standing on the legs is more or less liable to a baggy condition of the lower extremities at this time when all the tissues are beginning to show degeneration or softening. The muscles, fascia and subcutaneous tissues surrounding the veins give less support to the vessels. From this loss of tone of the tissues at this age and from the fact that the thinness of the muscular coat of the veins prevents them from having that rotundity, elasticity and contractility which are so characteristic of the arteries, and from the mere fact that the superficial veins of the extremities have few valves, the deeper veins having more than the superficial.

Is it any wonder that we have a patulous, baggy, ever-stretchd condition of the veins of the lower extremities? It is just possible that the valves and vein wall give way under the ordinary strain of life and are responsible for many aches and pains in the aged which are often attributed to muscular rheumatism and

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other causes, regardless of whether the tissues are edematous, infiltrated and broken down into an ulcer or not.

The veins of the leg, especially the superficial, suffer oftener from varicose conditions than any other, excepting the spermatic and hemorrhoidal veins. The hemorrhoidal plexus has free communication between the portal and systemic circulation which exists at the rectum, so any obstruction to the flow of blood through either the inferior vena cava or the portal veins tends to produce passive congestion of that plexus; also the fact that the portal vein contains no valves and it is situated in loose lax connective tissue which gives it no support. The same thing pertains to the superficial veins in the extremities, in a manner at least; they are situated between superficial fascia and subcutaneous tissue or connective lax tissue that does not support the veins, whereas the deep veins are supported with muscle and tendinous tissue. The internal or long saphena which is situated between two layers of fascia has few valves; they vary from 2 to 6 in number and unlike the external saphena they are mostly in the thigh. The external saphena has also a variable number of valves, from 3 to 9. The external and internal saphena nerves accompany the veins below the knee, which no doubt accounts for much of the burning pain complained of by patients. The two saphenæ communicate at the knee; here, also the internal communicates with the deep veins.

In most cases it is difficult to tell the true cause for varicose veins. The most probable etiologic condition is there exists a congenital defect in the vein walls and valves. Hereditary influences are probably among the first cause; excessive walking and standing on the feet; some attribute pregnancy as the cause; constipation, pelvic tumors, deficient innervation, femoral phlebitis; eczema is often associated, due also to faulty nutrition and circulation and usually preceding the ulceration; age and sex are strong predisposing factors, being more often found in women past middle age. The poor are afflicted most, which may be attributed to over-work, bad hygienic surroundings, uncleanliness and neglect. But one of the strongest exciting causes, with the exception of hereditary influences, is traumatism, especially in one past middle life if his work has much standing or walking or his tissues poorly nourished, or in any way predisposed, or has a sluggish vemous return of the extremities. Let such a patient receive a slight injury or the anterior tibial region, even though it may be some trivial bruise, scratch, cut from some sharp stick, rubbing of shoe top, contact with some sharp piece of iron, any small injury that the average man or woman would not take much notice of at the time of the accident, is liable unless well treated to result in a varicose ulcer. Injuries in this region are of much more serious import than any other part of the body in regard to healing up quickly and the formation of granulation tissues. A person with sluggish venous return will get along for years without much inconvenience until injured in some way to start trouble.

I will refer to two or three cases to illustrate and emphasize this point. that occurred in my practice during the last year. Mr. C. B., who came to me from an adjoining town, had been under treatment for three months. He had been walking along the railroad and fell, striking his leg between knee and ankle on anterior side, on one of the rails where it is spiked down, producing a slight skin wound with considerable bruising of the parts. Upon examination I found quite an ulcerated discharging wound, slightly edematous and red around wound. No varicose veins as far as could be seen, lower portion of limb was slightly swollen. Taking the age of the patient (55) into consideration, the flabby condition of his tissues and his occupation, I decided that the reason of non-granulation and healing of the wound was due to sluggish return circulation of superficial veins. I directed him to keep the limb elevated as much as possible, touched the suppurating surface with phenol, following with alcohol, washed with weak antiseptic solution, applied aristol ointment on gauze and put on a rubber bandage quite tightly. His injury was well in one week.

The second case was a farmer, age 52, who had been kicked by a horse three months prior to coming to me. A small injury on middle anterior tibial region was inflicted, light cut-

ting of skin and some denuding and bruising of surface. He went to his physician and had been under treatment, but it showed no signs of healing up and was gradually getting larger, edematous and hyperemic with slight swelling of limb below knee. I could not find much varicose condition of the veins; however, his tissues were poorly nourished and he was a hard working man, and I concluded, like the former case, it was due to faulty venous return over-distended condition of the superficial veins circulation. I ordered rest and support with the dressing similar to the first case; his trouble healed up in a few days.

One more case was that of a man shoveling coal. An engineer, Mr. J. C., aged 45, injured the anterior tribial region by falling on a sharp lump of coal, making a slight wound which his physician assured him would soon heal. But he had been under treatment for six weeks and the wound had shown no tendency to granulate. This case had more of the characteristics of a varicose condition than the other cases, yet it would be hard to say that he had more than an over-distended condition of the superficial veins. With rest and support by bandage he soon was well.

These, with many other cases of a similar nature, coming under my observation of slight wounds in the anterior tibial region that have been treated for weeks without any success until the limb was rested, with support to encourage venous return when they soon heal up, mark trauma one of the strong exciting causes in the patient who is even slightly predisposed to varicose veins and ulcers.

The treatment of varicose ulcers and conditions resolves itself into either surgical measures or palliative treatment. The surgical treatment in well-selected cases is the measure to be advocated when the consent of the patient can be obtained, but this is not always easy.

There are many methods of procedure and technic followed by different surgeons, each making claims for his way of operation, but all having one end in view and the same principle involved, namely: the shutting off from above of all weight of the column of blood which is the chief cause of producing and maintaining the varicose condition of the radicles of the internal and external saphenous veins or the local removal or destruction of the veins themselves. In case both the superficial and deep veins are varicose, there will be marked edema of the entire lower extremities, and in such case operative treatment is not of much avail. Phelps gives the following indications for operation: Cases where the condition constitutes disability in physical examination for different positions; cases where the size of the veins, the formation of venous tumor or the attenuation of the coats or tegumentary coverings cause hemorrhage; cases where chronic ulceration or eczema exists; cases where the circulation has been so far impaired as to occasion swelling of the feet or loss of power in the limb.

The Mayos, in deciding the advisability of operation in cases which give a previous history of severe phlebitis involving the deep vessels, apply an elastic bandage from the foot to above the knee. If this bandage can be worn with comfort, an operation should give relief. If the bandage causes discomfort it is probable that the superficial vessels are necessary to the circulation of the limb.

Perhaps the most popular method of operation is that of enucleation by longitudinal incision of the integument over the enlarged veins (Trendelenburg operation), careful separation of the veins from their loose bed between the two layers of the superficial fascia and removal after proximal and distal ligation.

The operation which I personally like, and I think the simplest for the ordinary physician to follow out, is the circular or horseshoe incision as practiced by Schede of Hamburg. Making a circular incision just below the knee joint, the knife being carried as in a circular amputation down to the fascia enclosing and forming the sheaths of the muscles; this incision will divide all the veins going to form both of the main trunks of the internal and external saphenous veins. All these branches should be carefully ligated with catgut and the flap or edge of the wound accurately approximated by stitches.

The Mayos have an operation of subcutaneous enucleation by making small incisions along the veins from 1 to 2 inches in length, making 4 or 5 such openings. Lately they have devised

a ring vein—enucleator, with a long pair of forceps for removal of the vein. But calcareous deposits, sacculations or extreme weakness of the walls of the vessels render this enucleation process unsuited in a certain percentage of cases, when we would have to resort to the open method.

There is a large majority of patients who will not submit to an' operation even if it is indicated, so in this class we must use the palliative treatment.

The palliative treatment you are all familiar with, but is is my experience and perhaps of many of you, that many physicians do not comprehend or have a good conception of the underlying principles and the object to be attained by treatment. Often you will hear patients speak of being under treatment with a physician who called their trouble, due to impure bloods, scrofula, white swelling or tuberculosis, and many other misleading statements that are hard to correct. Some two years ago a patient came under my care who had been treated for nearly a year for specific trouble. A case that with rest and support got well in five weeks. These chronic sufferers frequently go from one physician to another, and from the way they are handled sometimes it is no surprise that they should.

I will give you the history of one case as illustrating the way some of these chronic cases are treated. I was called to a neighboring town in July, 1903, to see Mrs. C., a farmer's wife; she was 59, phlegmatic and heavy. I found her suffering intense pain as she had done for years. and a nervous wreck. She had a distinct varicose ulcer on anterior tibial region of 25 years' duration. The limb below the knee was red and edematous, discharging freely of foul smelling pus; she had suffered so much during the last four or five years that her physician had to resort to morphin occasionally, but during last year her suffering had become so unbearable that he had resorted to morphin daily, until the habit was firmly established. The ulcer had never been healed up in the 25 years. She had tried many things and several different physicians, had been under the care of one man for the last 9 years and he had told her she could not be cured as it was due to impure blood that was inherited, until the patient had despaired of ever getting any benefit. I told them the best thing to do was an operation which was refused. I then got the promise of the family that they would carry out faithfully what I wanted done, put a trained nurse in charge, use moist dressings for one week with elevation of the limb in bed until some of the edema had subsided; curetted all necrosed tissue from base of the ulcer and applied phenol followed with swabbing off with alcohol, then dressed with combination of aristol and diluted citrine ointment and applied a rubber bandage from the toes above the knee night and day. The ulcer soon began to granulate and was well in four weeks. I have instructed her to wear a bandage all day. She has remained well and is like a new person.

There are two things of main importance in palliative treatment, rest with elevation of limb, combined with support. My own personal experience or preference is for the elastic bandage, the pressure can be regulated better. After an elastic stocking is used for some time it becomes stretched and it is almost worthless, but a good rubber bandage can always be adjusted to suit the case.

It has always been my custom to curette all necrosed and fungous tissue from the base of the ulcer, then apply phenol to the surface, following with alcohol, then to apply some good stimulating ointment on gauze, such as aristol, resorcin, ichthyol or citrine ointment well diluted with vaseline. While we must be careful not to produce salivation, yet I am partial to some preparation of mercurial ointment for its stimulating effect, and the ointments seem to have a better effect in stopping the itching and discomfort when the leg is bound up for support.

In conclusion let me urge that we all take more interest in this class of unfortunate sufferers, and there are many of them through the country whose life is anything but pleasant with the constant burning pain, the annoyance of the discharges, producing eczema and dermatitis. Some of the chronic cases drag along for years thinking there is no help for them, no relief to be attained.

Give them assurance if they will follow out

your procedure you can practically cure them, you will find that you can easily enlist their co-operation, make them fully understand that they must rest in bed until the ulcer has healed up, and when you have once got a firm cicatrix or scar formed over the base of the ulcer, keep track of your patient for some time and advise him fully about constantly wearing a support. It has been my experience that there is no class of cases which there is so much satisfaction in treating as these.

DISCUSSION.

Dr. H. M. Dean, Muscatine, Iowa: There is something that we learn in practice which perhaps we can give no good reason for, and the treatment of a chronic ulcer is one of those things. I had a German, about 38 or 40, who had been in the hospital, so he said, in Germany six months. They said they could cure him. He had a large open ulcer, larger than a silver dollar. He came to this country, went to St. Louis, and his ulcer troubled him so badly he had to give up work. Of course, he had no means of living, and they told him if he would go to the hospital there and stay six months they would cure him. He went there and stayed six months and wasn't well. He came to our city, went into a lumber yard, and his leg got so bad that he couldn't work very well, so he came to see me. I said I guessed I could help him. He said, "I know one thing, you won't let me work." I said, "Yes, you work along and if we can't cure you working we will try otherwise." So I gave him equal parts by measure of calomel and bismuth sub-nitrate; he used that and the ulcer got well. He was working in a lumber yard, they had a peg on which they balanced the lumber, threw one end around and then carried the other over. His partner was swinging one of these pieces of lumber and the sharp corner caught him right in the cicatrix. It opened up again and he had trouble with it. He went to work in a stone quarry, and he came to see me again—it got so bad. He said, "I guess you won't let me work this time." I replied, "Yes, work." I gave him the same treatment, and he got well. That is more than 15 years ago. The man has been a carpenter since, and he never has had any trouble with that leg.

I had a lady in Evanston, Ill., an elderly woman, nearer 80 than 70, and she had had a bad ulcer on the leg for a great many years, and never had been able to get anything to help it. I gave her the same treatment. That woman got well, and that is at least 10 years ago. I saw her only a few months ago, and it has not troubled her since.

Another one living out near Sioux City: The same treatment, she got well also. Calomel and bismuth sub-nitrate—bind it on dry, put it on dry. If you wash the limb with anything let it get dry before you put the powder on. Put that on dry. If it comes loose take it away. It it don't, and just seeps a little through it, put some more right on the outside. Don't disturb it because in disturbing it you may disturb the granulations. I never have had but one case that I didn't succeed in curing. That woman had heart trouble, with diseased kidneys, and the dropsy was so bad the dressing would stay dry only a short time after she put on the medicine.

Dr. A. E. Spalding, Luverne, Minn.: I was very much surprised at Dr. Campbell's results in treating these ulcers of the leg with ointments. If there is one thing under the heavens that is not to be used in these old chronic ulcers of the leg it is ointments. My experience has been to curette, remove the unhealthy tissue, slash the ulcer from one end to the other, cut through that hard indurated edge and make an unhealthy sore a healthy one, dress it with antiseptic dressings or a dry dusting powder of some kind, and your case will invariably heal. That has been my experience, and thousands who have been treated with salves go from doctor to doctor until they are discouraged.

Dr. J. H. McLain, Bureau, Ill.: I wish in this connection to emphasize the use of the wet dressing in these ulcers. Heretofore I have been in the habit of using dry dressings with compresses and bandages, with moderately good results. Of late I have been using moist and antiseptic dressings entirely in this class of cases.

I had a case a short time ago in a young man, aged about 30, who for a number of years had been a bartender, and consequently rather a heavy drinker. The circulation was very poor,

the blood vessels being in bad condition. He went to work on a bridge gang, and was struck on the shin by the sharp edge of a timber. As a result, he developed what might be called a varicose ulcer. He called at my office for treatment. Just previous to this I had been discussing with other physicians the use of moist dressing, and, by the way, the subject had come up for discussion at the last meeting of our county society. So it occurred to me that this was a case for the application of the moist dressing.

First, I powdered iodosol freely over the ulcer, then applied a heavy pack of gauze wrung from 1 to 1,000 solution of bichlorid over which I applied rubber tissue and a roller bandage. The bandage was applied only as tight as could be comfortably borne. Soon the sharp square-cut edges began to disappear, the ulcer, which was a very bad one extending almost to the bone, began granulating and filling up, and in four weeks was healed. I continued the same mode of dressing during this time, changing it each day. I firmly believe that this method, if persisted in, will, in a very large percentage of cases, effect a cure without the aid of any other remedy.

Dr. M. W. Bacon, Chicago: I have been much interested in this discussion, and from considerable experience in these cases I believe that the great majority of the cases of varicose ulcer of the leg, if well curetted out, and the patient put to bed and the limb elevated, will get well. But as to dressing, I do not believe it makes much difference whether you use a dry dressing or a wet dressing, use anything which will keep them clean. I think the compression and the elevation of the leg is the proper stimulus which tends to make the ulcer heal.

There is another class of cases, and there is quite a large percentage of cases among men, who will not lie still, who cannot lie still, who are compelled to work to support a family, and these are the cases in which something should be done to get them well as quickly as possible and allow them to go on with their work. A number of months ago I was interested in an article, and perhaps many of you have seen it, on the method of putting up the limb in what is called the Unna paste, which is a combination of gelatin, oxid of zinc and glycerin (I have forgotten the proportions).

The patient is put in bed for 24 hours with the limb elevated, kept high. The ulcer is thoroughly curetted, and beginning with a paint brush this paste put on warm. When warm it is of about the consistency of paste, but it hardens very quickly and is very elastic. Beginning at the extremity of toe with bandage, run your bandages as far as they will run without reversing, cut and go over again. Go up to the edge of the ulcer, skip the ulcer, and go on up to the knee, from the toe to the knee with several layers of this dressing dipped or painted over with the Unna paste. Let your patient go home and go to work, and dress the ulcer about once a week. Put on plenty of dressing over the ulcer, and in a majority of cases in two or three weeks the ulcer is practically healed. The one dressing which he wears will hold six weeks without any trouble at all. We have a very firm, elastic dressing, making uniform compression from the toe to the knee. What cases we have tried it in—and we have tried it in quite a number—have made good recoveries. The dressing I do not think makes so much difference as the compression.

Dr. William F. Fee, Meade, Kan.: We always like to tell of the large things. I think I have the champion long-distance ulcer of the age. I have an old man who has had an ulcer on his leg of over 50 years' standing. He told me on several occasions that it prevented him from entering the army, so you know how long it has been.

This year while at the Post-Graduate School in Chicago, I learned a system of using the Unna paste. When I came back I persisted in the use of this paste for about six weeks on the old man's leg. I was bound and determined if there was any good in it I would get it out of it, but it did not do as I had wished. I abandoned the use of the paste, and more recently I have been using nothing more than the hot boric acid dressing with a tight bandage applied from the toe to the knee, leaving it on as long as four days at a time without any change. The ulcer had run almost around the

ankle; there was just a small space of healthy tissue about the width of my two fingers on the inside of the leg. Under the use of the paste I believe it made some advance; I believe it commenced to heal, but it was not satisfactory to me. It did not heal fast enough, so I commenced with the hot boric acid dressing, and immediately I could see quite an improvement. Before applying the hot boric acid compress, I use the iodosol dusting powder, putting it on very thick and on top of that put a hot boric acid compress, over that oiled silk and then bandaged the leg clean up above the knee and leave it on some times for three days, sometimes four days, all owing to when I could get a chance to redress it. Under the use of the boric acid dressing this commenced to heal, and now instead of having a large ulcer running almost around the leg my two fingers would cover the sore. It is not the size of a dollar now, it is a little longer, but not as wide, and I think it will go on to full recovery from about 53 years' standing.

Question by a member: I would like to ask if you allow your patient to continue his work just the same?

Dr. Fee: That old man is over 90. He does carpenter work and paints. He painted a barn for me himself this year. I couldn't keep him still. He don't have to work at all, but he is one of those old men that you can't keep still if you tried, and he came to me, seeing I was building a barn, and wanted to know if he could paint it. I said "Yes, come down and paint it if you want to." I noticed him standing on a ladder away up in the gable end just a few days ago. My idea, though, is to put them to bed, and elevate the limbs; whether you put on anything or not is immaterial.

Dr. H. E. Campbell (closing): I have not much to say. In regard to the doctor's objection to ointments, I used that simply because you all know there is a lot of discomfort, burning and itching that goes with these cases, and especially when you put the bandage on. If you put on some dry dressing of calomel or bismuth, or even boric acid, your patient will come back in two or three hours and say, "Doctor, I can't bear that, it is just burning the life out of me, I want to take it off." Now if you put on a moist dressing, or if you put on an ointment of some kind, they will bear that bandage good and tight. If you put them on their feet I do not believe any man can get the best results in various conditions of any kind. I don't believe you will get results with the man walking around. I do firmly believe that in almost any case of varicose ulcer by putting the patient in bed and elevating the limb 45 degrees or more, keeping it that way night and day for two or three weeks, you can granulate it up and heal it. And then the point is keep your patient wearing an elastic bandage, if they won't submit to an operation. There is a certain class of cases which are not fit for operation, an operation won't do any good when the legs are swollen clean to the hips, old broken-down patients with bad hearts, kidneys diseased and all that sort of thing, you will not get results from an operation. I want to tell you, Gentlemen, that you can do a whole lot with every one of these old cases—practically cure them, if you will put them in bed and get a trained nurse to look after them.

This woman that I cited—the family had been talking of taking her to the asylum for 2 or 3 weeks—a morphin eater—I had that to contend with, I had to break her of the morphin habit. Now that was a bad case. We all see these cases that are running over the country asking for help. There is no question about it, if you cannot relieve them by putting them in bed and getting the old ulcer healed up, they can be relieved, most of them, by an operation.

I have a patient who was relieved by the circular incision, a woman who went on her knees at times during hot weather to save her legs. Before I went to that town, 10 years ago, physician after physician had treated her without giving her relief. The first time I went to see her I made arrangements for operation, the ulcer healed up in two weeks after the operation, and has remained healed ever since. There was a woman that had gone some 32 years without help. She was an English woman, and had traveled to England, even, to try to get relief. Her husband was well-to-do, and he spent lots of money trying to give her relief. I haven't a doubt but what if that woman had been put in bed for three weeks with a nurse or some-

body to take care of her, with any ordinary good dressing, the ulcer would have healed promptly years before.

SKIN GRAFTING WITH REPORT OF A CASE.*

J. F. PEMBER, M. D., JANESVILLE, WIS.

We have in skin grafting a measure which, when properly used, will save "life and limb," to say nothing of the pain and time saved patients when recovering from injuries where large areas of skin have been lost.

In surgical literature, we read, that John Hunter, over a century ago succeeded in transplanting the spur of a young cock from its leg to its comb, afterward to the comb of a second bird and found that it lived and grew. He probably never dreamed that his experiment was the forerunner of a practice which would become universal. The practice of skin grafting can only be appreciated when one has become thoroughly familiar with the number of limbs which can be saved by the process and understands the economy of time and pain and the lives that will be saved by its proper application.

The skin used in grafting may be taken from the patient or from other persons or from animals—chicken, kitten, rabbit, dog or frog. The inside skin of an egg grafted on to a granulating surface is said to have produced new islands of skin. And lastly, skin taken from the dead human body, as late as 36 hours after death, has grown.

I have tried egg skin and out of many, many trials I never succeeded in growing but one island of new skin. I have on several occasions used frog skin, invariably with failure.

Skin from the belly of the dog has been successfully transferred to the human body, and after the lapse of time, cannot be distinguished from the skin surrounding it. Young chicken skin has also been used successfully. The skin from the negro has been transferred to the white man, and vice-versa. However, when the negro skin has been transferred to the white man, the pigmentation persists for a long time; and if the grafting is done in small, isolated patches, the black skin grows.

In all ordinary cases enough skin can be secured from the patient needing it, and if possible it is better to use the skin of the patient. For when skin is taken from others there is ever the possibility that disease may result and, as a rule, the patients requiring this treatment have all the load they can carry.

To successfully skin graft, all the conditions must be right; especially must the wound to be grafted be in proper condition. When grafts are supplied to fresh wounds nothing is needed more than the complete stoppage of bleeding. E. H. Ochsner says that "The grafted skin will grow on any fresh surface, except on a tendon denuded of its sheath or a bone denuded of its periosteum." In all other wounds it is necessary to have healthy granulation tissue; that is, red, solid granulation.

There are several different methods of obtaining skin. One of the older methods, and one little used today, was merely scraping epithelium on to a healthy, granulating surface, both surfaces being perfectly clean. Another method is that of taking isolated patches, ⅛ to ¼-inch square and placing them from ½ to ¾-inch apart. This method is quite a help in many cases. Another is known as skin transplantation, taking the whole thickness of the skin and transferring to a granulating surface. This works well, so far as the granulating wound is concerned, but the quite deep ulcers left by its removal require considerable time to heal, and this is a great objection.

Undoubtedly the best method is that of Thiersch, modified as has been recommended by Ochsner and others. This consists in having a perfectly healthy and suitable condition of the wound to be grafted; an area of some part of the body made perfectly clean without antiseptics being left on the skin. The outside and anterior surfaces of the thigh are mostly used because they are the most convenient and accessible. However, many other parts of the body may do. A wide-bladed, sharp razor which has been sterilized by alcohol and all the alcohol removed by plenty of sterile water is used for the purpose. If extensive work is to be done

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a general anesthetic is needed. The skin of the thigh is made tense by the help of an assistant; the skin is perfectly dry, also the razor; thin grafts are cut off the size needed, great care being used to remove only the epidermis and tops of the papillæ, the cutting edge of the razor remaining always within sight. The graft cut is removed to the dry granulating surface, and is spread on by teasing the graft off the razor with needles, and the proper adjustment made in the same way. In this manner a large surface may be grafted in a short time. In the dressing a network of rubber protective strips is placed over the grafts, and over this a sufficient amount of gauze, well strapped on.

If all the conditions are ideal the wound is healed within 2 to 4 weeks, as is also the surface from which the grafts are taken. The grafted surface is left undisturbed for a period varying from 7 to 14 days, when the dressing is carefully removed in order not to disturb the new grafts. Skin formed after the use of this method will serve all purposes of the original, whether the grafting be done on hands or feet (the parts of the body most in use) or elsewhere.

I desire to report the case of C. W., a freight brakeman, who was injured August 7, 1906.

He was in the act of stepping on a moving engine. His feet slipped off the oil box and the engine wheel passed over it producing a crushing injury, starting at the anterior surface of the ankle joint, stripping off all the skin and cellular tissue back to the heel, crushing all the bones of the toes and severely lacerating all the soft parts of the foot. All of the crushed bones were removed, the skin and cellular tissue brought over as much as possible and an attempt made to save the remainder of the foot. Most of the skin and cellular tissue sloughed away leaving a raw stump about 6 inches long on the anterior part of the foot and 4 inches long on the posterior part. This was covered at two sittings with grafts taken from the patient's thighs. In covering this quite large area only 2 grafts died or were lost. He has at this time a sound, useful foot, possessing the three points of contact required for walking without much limping. Without this method this man must have submitted to a Syme's or Pirogoff's amputation.

DISCUSSION.

Dr. E. L. Bowman, Madison, Wis.: I do not believe there is any subject which can be of more interest to us than skin grafting. In railway work we are all liable to come in contact with more or less of it, and I do not think there is any one little thing in which there is so much detail that needs to be followed out.

I had occasion recently to do an extensive piece of skin grafting after a burn, and it afforded me an opportunity to make a good many observations that I think might be useful to all of us. In such cases we usually have infection—it is almost impossible to prevent it. Where the infection burrows down under the granulations I found it necessary before successful grafting could take place to thoroughly remove the granulations and follow that up with a liberal use of peroxid of hydrogen. Then after placing the skin grafts, instead of using rubber tissue the method I found quite successful was not to dress them at all, just simply leave the parts absolutely exposed. Of course an extensive burn causes an enormous loss of heat to the system and I devised a framework of bamboo to keep the bed clothes off the raw surfaces.

Another point in the grafting is not to use any moisture of any kind, but keep the surfaces as dry as possible. Irrigation seems to have an exceedingly bad effect on the grafts. In place of any irrigation, after 5 or 6 days, when I was satisfied the grafts were either going to take hold or come off, I simply protected the surface with an ointment either of vaselin or lanolin. I used both and they seemed to give equally good results.

Another thing I found was that skin taken from the patient was more likely to take than skin grafted from another individual. Why that is so I am not prepared to state, but I find that the literature on the subject corroborates this. But grafting will sometimes be successful when done in an apparently bungling sort of way, and it may fail after most careful preparations. It is, in my opinion, one of the most uncertain things attempted by the surgeon. In my own experience I had been very successful in one case in grafting and so had great confidence, but my next experience rather

took the conceit out of me. In attempting to graft the greatest care and precaution should be used in the entire technic of the operation.

Dr. H. W. Bernard, Emmetsburg, Iowa: I have had some little experience with skin grafting and I want to corroborate what the doctor just said about the uncertainty of it. I remember one case that occurred some seven or eight years ago, the arms of a woman being extensively burned from a gasoline explosion. I tried grafting three different times, supposing each time that I had the conditions right, twice grafting from her own skin and once with the skin taken from another person, and failed each time. The fourth time I used skin from a man's hand that had been amputated about 24 hours before. During the interval the skin had been kept between layers of sterile gauze and boric acid solution, and we had a perfectly good result. I cite this case simply to show the uncertainty of the process.

Dr. E. H. King, Muscatine, Iowa: I have tried skin grafting a good many years with varying success. I have found that to take the skin from the same individual gives more certainty of good results than to take it from some one else. And I have found that it is very difficult to get a skin graft to grow. I have seen cases in hospitals where the patient is put under an anesthetic and the granulations scraped out deep to the sound tissue so that good reparative action could be had, and the grafts would grow. You know they will sometimes heal about so far from the edge and then stop, you curette the edge and they will grow a little more and then stop; you curette again, and you try to graft in a little island of skin here and there. I think that in some cases the fault is in the patient—the vitality is low.

A year or so ago I had a patient who had been here in the hospital under the care of Dr. Senn for three months. At first with the utmost care I absolutely failed to get any islands of skin to grow. Finally I resorted to this method: The skin is elastic and can be drawn together. I drew the edges of skin towards each other and applied a zinc oxid plaster, keeping it there 3 or 4 days, then removed it and repeated the process, the skin becoming adherent ¼ or ½-inch every time, until I finally closed that space, originally 2½ by 3 inches, with sound skin. The time required for this was about 6 weeks. The man is now absolutely well. You must have an absolutely aseptic condition; if there is any suppuration the graft is destroyed. You must also get a healthy base or soil for the graft in order to have good reparative action or you will fail.

Dr. C. A. Lester, Wabasha, Minn.: The case cited by the essayist is one that resembles to some extent a case under my care for awhile, and about which perhaps Dr. Bouffleur can tell you more than I can. A young man sustained an injury by the plow of a gravel train, in which the whole bottom of the foot was torn off, including the plantar tissues down to the bone, leaving a space absolutely denuded of tissue beginning at a point at the heel, running forward and including the whole width of the ball of the foot and tearing a good deal of skin off the instep. The great toe was broken and nearly torn off at the metatarsal articulation and the second metatarsal bone crushed at about its middle. The wound looked pretty bad, but when cleaned up we finally succeeded in making it present a tolerably good appearance by amputating the great toe at the metatarsophalangeal articulation, the second metatarsal bone at about the middle of the bone, and the fourth and fifth toes. At that time we left the third toe on, later amputating it. Then by stretching the remaining skin of the instep down as far as we could and dissecting up the sides of the heel we got the posterior half of the bottom of the foot fairly well covered. But the whole front half of the foot was raw and badly ground up, full of dirt, and in pretty bad shape. Another complication was that this young man had a condition of the skin resembling ichthyosis; in fact Dr. Bouffleur thinks it is a case of ichthyosis, so it was impossible to graft his own skin, but necessary to take grafts from another individual.

But what made me wish to mention this case here is that we followed the method originated by Dr. Snevé of St. Paul, the open method of treating burns and grafts. We waited for a few days before grafting so everything would be in as good condition as possible. After grafting things went along all right for 4 or 5

days, until along the edges between the grafts appeared little scabs, probably infected from the air. I built a little tent of sterilized gauze over slats, removed the scabs, and had no further trouble. All the skin over the stump of the big toe came off. We grafted, and it sloughed again. Then I sent him to Dr. Rochford of Minneapolis, and he told me that he believed there was an inflammatory condition of the head of the bone on the stump of the big toe. An incision showed a condition of osteoporosis.

We then amputated the metatarsal bone at its middle, placed the denuded toe against the calf of the other leg and had it kept there until the flap grew on the bone, and it was all right. But the removal of the flap left a large and deep ulcer on the calf of the left leg, with which we had no end of trouble. We tried to graft that a couple of times without success; we took skin from his own leg, no good; took skin from the leg of his brother, it didn't work.

I was preparing to graft chicken skin, but upon looking up the literature I found that the general consensus of opinion was that even if successful at first it is ultimately unsatisfactory, so I made up my mind I would graft from the skin of another young man who had offered himself for this purpose. I had all arrangements made to graft on Monday, but was taken sick on the preceding Thursday, so I sent him to Minneapolis and Dr. Rochford tried his hand at it. I do not know just what Dr. Rochford did at first. The ulcer which had developed was as large at the hand. He grafted from the patient's skin without result, then from an amputated limb with fairly good results, and sent him home with the ulcer healed except a curved line of ulceration about ½-inch wide and extending around the entire margin of the original ulcer. I dressed it with balsam of Peru, castor oil, castor oil and stearate of zinc, and other things, and these did no good. Finally I sent him to Dr. Bouffleur, and he can tell you the rest.

Dr. L. R. Head, Madison, Wis.: The paper has many suggestions of value to the railway surgeon in regard to conservatism in many operations.

Two cases I have had under my care in the last few years have demonstrated the possibility of saving considerable part of a limb by resorting to skin grafting. The first one I recall was the case of a man whose foot had been crushed by a car wheel and virtually amputated just back of the metatarsal joint. I allowed Nature to finish the amputation under aseptic conditions, and when granulation had proceeded far enough I covered the end of the stump with a skin graft, and had an excellent result which saved the man his foot, and he was able to follow his vocation as brakeman without any apparent inconvenience.

The second case was a recent one, in which there was a question of amputating through the knee joint or saving 4 to 4½ inches below. The anterior flap was wanting. A posterior flap sufficient to cover a part of the stump could be had. I drew that forward and allowed granulation to take place and grafted over the remaining exposed part, which was about 4 or 5 inches square. Much to my surprise the grafts were successful, took beautifully, and also contraction took place, and it took place along the line of least resistance, and in this contraction the posterior flap was pulled forward so that nearly the entire end of the stump was covered with a good, soft, thick tissue, the skin graft on the front. The result is a flexible knee joint, which could not have been saved otherwise, and he will in all probability be able to wear an artificial limb with a great deal of comfort.

Dr. C. L. Wendt, Canton, S. D.: Some of our text-books make the statement that loss of the skin of the sole of the foot generally indicates amputation. I have had some little experience in grafting, and I recall one case where the skin was torn off the sole of the foot, without any destruction of bone. I grafted the case, and it was a failure; the patient passed out of my hands, went to a hospital and had it grafted again, but this also was a failure, and the only way that raw surface was ever covered was by amputating the great toe and taking enough skin from the foot to cover over the denuded area. I would like to get the consensus of opinion as to whether it is possible to get a skin over the sole of the foot by grafting that will sustain the weight of the body to make it useful.

Dr. A. I. Bouffleur, Chicago: I would like to have some gentleman discuss the question as to whether grafting on a granulating surface or one in which the granulations have been removed is best.

Dr. W. F. Morrow, Kansas City, Mo.: I remember that while I was connected with the Metropolitan Street Railway of Kansas City, a little child received a severe injury in which nearly all the muscles of the legs were torn off, with fracture of the bone. We removed all the dirt that we could get out, and finally had fairly healthy granulations covering the denuded surface. I tried skin grafting on those granulations that had gotten a little bit too exuberant. I took a sharp scalpel and slipped it through and with it cut off the top of and planted little pieces of skin on the spots of granulating surface; they grew there and I had a splendid recovery, the entire surface being covered with healthy skin by that method.

Dr. G. A. Ritchie, Appleton, Wis.: My experience in skin grafting is somewhat limited. On looking up the subject referred to by Dr. Bouffleur I found the authorities differ as to whether we shall have a sound base upon which to plant our grafts, or plant them on granulating tissue. My experience is that the sound base, after it is curetted, is a better process than to graft on granulating tissue. We have success with both methods, and frequently failure with both, as has been previously stated.

Dr. E. O. Plumbe, Rock Valley, Iowa: I would like to ask Dr. Pember and others here one question: If you have a granulating surface and desire to skin graft and you curette the granulations, whether it is necessary to wait until hemorrhage ceases before applying grafts. In other words if the grafts are applied before the hemorrhage ceases, will you have as good results as though you wait until you have no hemorrhage?

I had a case in 1901. A girl of 16 had lost a considerable area of epidermis from her legs from a severe burn by gasoline explosion. In one of them there was no question but that the only method that would produce healthy skin over the denuded surface was by skin grafting. In one of them the grafts took without any trouble, using skin from the patient herself. The other one did not.

In cases of burn there is an element of infection existing which, in my opinion, counteracts and combats the healthy growth of a skin graft, and in the ones that I failed on several times before I succeeded at all I attributed the failure to the fact that I removed the granulations, imagining from authorities I had at that time that this was the proper method. The moment I ceased and left the granulations alone and applied the grafts on top of the granulations without interfering with them at all, I had a fairly good result, although I had to graft twice on some two or three spots before I succeeded. Today there is practically no scar. Of course there is a mark, but for all practical purposes the epidermis is as good as on any other part of the body. My opinion is that curetting was one factor in not allowing the grafts to take.

Dr. J. G. Hayden, Kansas City, Mo.: We have had some little experience in skin grafting at the Monroe Street Hospital. And at the time of skin grafting, if we can get a perfectly new, plane surface we skin graft primarily, covering the surface with a Thiersch graft. We do an early operation, not waiting for much granulation tissue to grow, because if the grafts are put on a base of granulations they may take all right for awhile, but in the course of two weeks we find them sloughed, due to strangulation of the blood supply brought about by contraction of the scar tissue.

Another point is whether the grafts shall be covered or not. If we have a broad surface, on the thigh, for instance, easily accessible, to which we apply skin grafts, we then take a piece of clean wire screen, sterilize it and fix that over the graft, sew it and strap it with adhesive straps. That will serve as a protection and for drainage through the meshes of the wire, and in the course of 10 days the whole wire and dressing may be removed and the grafts will take. By the open method of treatment, the grafted surface cannot be kept clean in the city; in the country it may be different.

Reverdin grafts can be used on a granulating surface; they take very well, but it is a slow method of getting the result.

In skin grafting about the extremities, it is well after the grafts are applied and all oozing has ceased and the grafts are covered, to place a splint upon the extremity. In that way we control movement of the part.

In the case referred to by Dr. Lester, which came under our care with the ecchymosis, we put this man on potassium iodid for some little time, used grafts taken from his own skin and dressed it with gutta percha, the dressings outside of this were wrung out in salt solution, we put a cast on the leg and the grafts took well in the course of 2 weeks. He made a good recovery.

Dr. A. I. Bouffleur, Chicago: I am not satisfied on this question of skin grafting on granulating tissue. I am personally thoroughly convinced that the method of choice is that on a bare surface, entirely devoid of granulating tissue, not only for the reason Dr. Hayden has just mentioned, contraction of the scar tissue formed from granulation, but from the fact that we cannot be absolutely sure of the asepticity of our granulations. We very frequently graft directly upon the granulating surface, when, for instance, we have an amputated limb and we have a large surface, we can take a few strips and simply put them on the ulcerated surface without any anesthetic or preparation, very frequently they will adhere and cover the surface for several weeks even.

We recently had a case in the hospital in which we covered an area a foot square in this manner, and the grafts remained intact and covered admirably for a time, from 2 to 6 weeks, but practically all of them came off. I recall also the case of a foot which was grafted on granulating tissue, it healed perfectly and the man was discharged; in about 2 weeks he came back with slight tenderness of the part, a little layer of granulation was underneath the edge of the graft, and inside of a week the whole graft disappeared. That occurs from two conditions: First, infection; second, poor nutrition. If we have a surface so located that we are particular about the appearance afterwards, we like to take off all the granulating tissue, because if we do not we are very likely to get contraction and it is not an uncommon thing to find a decided wrinkle, and several wrinkles for that matter, right in the surface of the skin graft occurring a few weeks after the graft is made.

As a rule we do not use a general anesthetic for skin grafting. We give the patient some whisky and morphin and then hypnotize him by setting Dr. Hayden talking to him, "jollying" perhaps, but always when you do that wait until the whisky has taken effect; do not give a dose of whisky and then begin operating quickly. We find that the fear is some objection, that the immediate pain is objectionable, but these are greatly relieved by a couple of drinks of whisky half an hour before, with a hypodermic of morphin given half an hour before. Then the patient will submit to the removal of large areas, 30 to 40 square inches, without any serious objection and also to the use of the curette.

We use the curette on surfaces of which we are not absolutely sure of the asepticity, and we use it freely; but we have a sharp one and we make the one stroke do its work and not keep nagging at the surface for half an hour when we should do it all in 2 or 3 minutes, Patients object at the time some, but they are glad afterwards that they did not take a general anesthetic. We find those surfaces heal much better and remain much more permanently as a uniform result than where we graft on a granulating surface, even though it may be apparently ever so clean.

Some operators remove the granulations and wait 2 or 3 days, and just as they are beginning again they graft. That is what I wanted some one to bring out. I haven't had any personal experience of that sort, but it seems to me it might be a good plan.

One point in regard to the case reported by Dr. Lester. We had to expose the muscular tissue in order to get out the scar tissue. We took out all scar tissue formed in that man's leg and had a surface some 4 or 4½ inches in diameter. In order to keep the limb quiet we put it in a plaster cast, and I feel it was because of this fact that the result in that case was different than it had been in the previous attempts.

I do not know much about the dry dressing. Dr. Hayden mentioned the use of salt solution.

I have always been in the habit of wringing the dressing out in salt solution, quite dry and putting it over the surface, and then strapping it so it will not slide around. The serum is taken up by the moist dressing and it makes a pretty good support for the grafts. We do not put any paper over it, simply the one dressing and some cotton outside of that. I always look at a skin graft the next day and if there is any moisture present or lifting of the graft I relieve that condition. From that time on it is often unnecessary to dress it. But I always feel safer if I look at them the next day than if I let them go 5 or 6 days without observation.

I wish to emphasize the matter of immobilization mentioned by Dr. Hayden. It seems we have been getting better results, especially in plastic work, when we have paid more attention to immobilization of the part than we did before, and I believe there is something in it.

Dr. L. R. Head: I believe that trouble sometimes results from not getting the grafts in through apposition to the grafted surface. It is such an easy matter when sliding the graft off the razor with your point onto the skin to get a little bubble of air under the graft, and any considerable amount of air remaining there will act as a preventive to the taking of the graft, and I think that a great many times failure is due to that one condition.

In regard to Dr. Bouffleur's suggestion as to the propriety of taking off the granulations and waiting a day or two for new ones to form, I had one experience in that line with good results. It was not the purpose, however, from the beginning; I removed the granulations in preparation for grafting and then was obliged to desist, and 2 or 3 days afterwards when new granulations were just starting I was ready for the operation and had a beautiful result.

Dr. Bouffleur: If I have an indolent ulcer without granulating tissue I do not curette; I get a knife under it and cut it all off. Sometimes it takes an hour or so to control the oozing and in such cases I presume it would be just as well to wait a few days for granulations to start, when it would graft very easily.

Dr. Pember (closing): I am grateful for the free discussion that has taken place. I have learned many things I did not know before. The treating of these cases that have been grafted by no dressing is entirely new to me; I have never tried it, but if I have occasion to treat a case of this kind again I will remember to use it. I also did not know that skin taken from the patient was more apt to grow than if taken from some one else.

Now, while these cases heal in a short time, that is, in 2 to 4 weeks, they are not well. Take this man's foot; it healed in a little while, but it would be 4 to 6 weeks before he could use the foot to walk on.

Dr. Head has illustrated just why I wrote this paper; that is, he in his case saved 4 inches of leg which without this method would have had to be taken off. There are a great many cases in which we can save limbs by this process, and we ought to take the chance of saving them instead of going ahead the first time we see the patient and doing an amputation. We once had a case in which 4 square feet of skin was lost from an extensive burn. Many and many a time we grafted that case, and as many times we saw our grafts disappear, but finally within a short time after this we grafted again, and the grafts took. Of course we took no skin from the patient at all; it was all taken from other people. After a while the patient was healed and she is a well, strong, sound woman today.

In regard to grafting on granulations it has always been our practice to scrape the granulations off down pretty well to a solid base and to take plenty of time and stop all oozing. If you do not do that they usually will not take, whereas if you do, it has been our experience that in most cases the grafts take.

We had occasion a short time ago to remove a breast where the carcinoma was so extensive we could not cover the part with skin. We skin grafted, but one graft sloughed; we put another in its place and it stuck, and it seemed as though it grew fast inside of half an hour. The patient fully recovered. In the case reported in my paper, the man walks with very little limp; he has good skin where grafting was done, and the greatest proof to my mind that it is good skin is that he has developed a healthy corn on the foot.

OBJECTIVE VS. SUBJECTIVE SYMPTOMS.*

E. J. WADDEY, WATERLOO, IOWA.
District Surgeon I. C. R. R.

Are symptoms real or imaginary, either original or suggested? This is not intended to cover pure malignness. Space will not permit consideration of the ones who are non-employes and start out premeditatedly to defraud.

This subject is always of so vital importance to railroads and thereby to railway surgeons that I think no other introduction is necessary. I also assume that it will not require a great volume by me to get it properly before the house. I will not presume to imagine that I can say anything new upon the oft hashed up topic, but will select a typical case to lay before you where a certain turn of mind would, with favorable surroundings, surely (and maybe without) have been a case of slow recovery.

F. E. C., a bridge laborer, fell a distance of 25 feet from a defective ladder, as stated by him, while engaged in repairing a water tank. He was sent to me for treatment, after first being seen by Dr. Staples of Dubuque. This individual was a man 5 feet 11 inches tall, weighing 135 to 140 pounds, who had been troubled with bronchial irritation for a number of years—a typically favorable subject for a prolonged illness after such a fall. This man suffered a considerable shock and had great pain in the lumbar and lower dorsal region; the right shoulder was injured showing considerable discoloration, which disappeared after the usual time. He was taken to his home and his temperature ran up to 102, wretching pulse, reaching 130, with severe headache and pain bitterly complained of over the kidney region. *This* was *real*, I take it, for this patient had considerable trouble in getting a bowel movement; I think not until the third day. I made my usual morning call just after he had accomplished his first movement and found him with an alarming amount of depression, pulse 160, thready and with subnormal temperature. Following this he improved and made an uneventful recovery, returning to his work in two months. I will say that he did not go around consulting other physicians. I did call in their family physician the morning his pulse was 160 for my own protection.

In the spring of 1906, a young man 26 years old, Mr. J., was coupling cars at Doris and was caught between the dead-woods so that he got his sacrum, left hip, and groin on that side bruised. The space between the dead wood is said to be 4 to 6 inches. He was caught so that the right anterior superior iliac spine was not involved. Dr. Shellito, of Independence, brought me the patient. He showed no motor or cortical disturbance. We catheterized him to see if there was any blood in his bladder, and found none. After four or five days he did not like the hospital, so I allowed him to be taken home. Saw him each day with instructions that ten days' rest would be required. However, after about ten days, when I had not been seeing him each day, I dropped in on him and, as his bedroom was near his front door, I had been accustomed to walk right in, supposing him to be there. Not finding him, however, I walked back and heard the balance of the family were in the kitchen. He was standing up in a chair repairing a window shade. This patient, now, at no time had had any objective symptom save the slight ecchymoses in groin and over right sacral region, left anterior iliac spine not injured. He remained under my care for some eight weeks or more and, at that time, there had been no atrohpy. I had a friend of mine take an X-ray picture of his pelvis, which showed nothing, although he had been told by a quack at Manchester that his pubes were fractured and that there was a decided callus present, which there was not, as is shown by the picture which I will pass among you.

Here we have two cases quite similar in reality and both of them should have recovered alike, but we have in the one a rugged young man with that turn of mind which turns

*Read at first annual meeting Joint Association of Railway Surgeons, I. C., Y. & M. V., and I. S. Railroads, Memphis, Tenn., February 27, 28, 1908.

strougly tward the often encountered inclination to get something for nothing—a subjective symptom which originates purely in the central system. This man's habits and associates had not been the best; he owns a farm which his father gave him and which he was either too indolent or otherwise incompetent to carry on, but rather engaged in brakeing on a railroad, the most hazardous occupation. He simply thought after he got caught that he did not have ot brake and did not want his job, so would get all he could from the company. The other man is a good, honest fellow with a family dependent on him, who wanted to—and needed to retain his position and did. He is now working today apparently as well as before.

I believe that the surgeon's natural intuition should always be kept alive, for we can never tell when this subjective symptom will crop out. I believe this first case, which I have outlined could have recovered from the company for the reason that he had objective and real *instead* of the assumed subjective symptoms. He was and is a hard looker—I think a tuberculous subject. He had pain—temperature—rapid pulse. I could tell when his temperature reached normal that his pulse had reached near normal, for it is rapid now. But if he had continued to have pain and walked in a stooped or crouched position, who of us could have positively claimed that he did not have pain? Who of us can see a pain absolutely and be sure of its appearance and disappearance on the scene?

I believe right here comes the lesson of how important it is for medical men and legal lights to advise people honestly and *fearlessly* and to refuse to be influenced by the cramp that so many are unfortunately endowed with. It has always seemed to me that if injured people were not influenced in this weakness their injuries would yield more easily to ordinary treatment and we would not be forced into a legal consultation—frequently with a quack legal light. I believe railroad surgeons and claim agents should be in a certain kind of open and above board consultation, so the employes have confidence that they will be treated right and that where the company is liable they need no legal advice, being treated fairly by the company without. But for bad advice by neighbors, or perchance a meddlesome physician who chances to be called by some one who has been injured, begins to go beyond the legitimate role of an honest physician. Unfortunately, our profession is not composed of all good material, with honest motives and sound judgment. If we were all properly ethical at all times, this type of trouble would be greatly curtailed, but some men are absolutely unable to preserve their dignity and will sooner or later compromise themselves personally, during a convalescence from injury, by allowing some word to drop which will refresh a subjective symptom that had almost subsided. The golden rule should be remembered, then all would be treated fairly.

Only a few years ago I knew of a railroad company paying $9,500 to a man who was going around in a crouching position with his right shoulder held up. He complained of pain, wincing on pressure and motion in a way apparent to any one. The deltoid and biceps measurements were normal, or rather hypertrophied about ½ inch greater than the left. His own medical—not legal—advisor knew what this discrepancy meant, and I believe their real ignorance helped to make the bluff good.

It is an easy matter for an injured man to claim he is not recovering and it is very easy to influence the subjective centers when it is along the line which seems desirable to the patient. This condition of mind which seems ripe for suing a railroad company for $20,000 for an injury not permanent is probably a mental condition bordering between the physiologic and psychologic. There is a certain number of people in calling, both high and low, who think that their superior mental ability will enable them to deceive the average honest man and thereby make them safe from detection and criticism in their questionable acts. The question of the real malingerer has not been touched upon for obvious reasons, mainly lack of space and the fact that we as surgeons should study the mental condition of our patients a little more closely and occasionally give them a little at-

tention which is really not necessary most of them will keep a better flavor in their mouth, and recover more promptly.

To illustrate, a short time ago, less than three weeks (and something similar is not uncommon), I was called to see a fireman who had been thrown some distance, sustaining small cuts over brow, having cinders under the cuticle and a cut directly over chin of an inch in length, which on account of its position gaped 1-3 inch. He also had a separation probably of one of the costal cartilage about the 8th or 9th. All the attention he received from the surgeon, who saw him at another town the night before, was to impress upon him the importance of being very careful (whatever that is) lest he get pneumonia therefrom. This man claimed that he requested the doctor to clean him up and he was told that the air was best for that. Could any pure-minded man blame this man for not feeling the best about this kind of treatment?

DISCUSSION.

Dr. L. C. Henley, Chicago: One of the most important things to the railway surgeon, almost as important as the injury itself, is, I believe, the detection of the real and the assumed subjective symptoms, and this is ordinarily a difficult thing to do.

In my opinion the best thing to remember in attempting to differentiate between these is that there are very few good liars, and almost invariably by judicious questioning you will be able to get the patient to contradict himself or herself, or to make statements which will at any rate render you morally certain that the subjective symptoms are not real, and where there are objective symptoms you can easily find out whether the patient is attempting to exaggerate.

My plan always is to make very few remarks to the patient, but to ask him questions all along. I ask them to tell their story, and then question them on the different points, and try to locate the pain. Very few who claim pain and haven't it can get the pain in the same spot twice. You can direct their mind to some other channel, making pressure over the different regions where they claim pain. Sometimes the places indicated will be 4 or 5 inches apart, and each place will be *the* place. They will tell of the different troubles they have, claiming them as the result of certain injuries, when you know very well that these conditions did not follow the injuries alleged. Then when proceeding to impress the patient that you are onto his game," the less you say the better; a little smile or shrug of the shoulder or casual remark will be more effective than to tell them why you should know better. The less you explain the more he will think you know and the greater the chances are that he will drop his injury immediately without suit.

AT WHAT STAGE AND UNDER WHAT CONDITIONS SHOULD AN INJURED EMPLOYE BE PERMITTED TO RESUME WORK?*

L. C. HENLEY, M. D., BURNSIDE, ILL.
Local Surgeon I. C.

I am in the fortunate position of the fisherman who returned home with an empty creel and was able to state that he had caught the biggest fish in the stream, but he got away. I am able to say that I had the best paper to be read, but had other matters on my mind and threw the wrong paper in my grip. I haven't it here. I will try, however, to make a few remarks, more for the purpose of starting discussion than giving anything new.

At the meeting of the American Association of Railway Surgeons last fall a remark was made by one of the attending surgeons in attendance protesting against permitting men to resume work until they had entirely recovered from the injury, stating it was bad policy to permit a man to resume work while his wound was still unhealed. Upon thinking this matter over I concluded it was a subject worthy of consideration.

It is with the minor questions that we have to deal more frequently than with the treatment of the more severe injuries and more uncommon conditions.

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I do not agree with what the doctor said. We have to consider in this matter not only the treatment which will insure the most rapid recovery, and recovery with the least permanent disability or disfigurement, but the financial condition of the patient, and as railway surgeons we have to consider also the welfare of the company, the two latter considerations being, of course, minor to the physical condition of the patient.

As to the physical condition of the patient, I presume all of us have had cases of injury to attend which progress so far, and then, in spite of all we can do, seem to stop. I have had these cases, and sometimes I thought the patient should remain away from work, that resuming work would aggravate the trouble, but he felt compelled to resume, or he became tired of laying around, and started to work again, and almost immediately the wound would heal. This puzzled me at first, but upon studying the matter over it seemed to me that the same theory would apply in that case as in our more modern treatment of sprained ankle —strapping and telling the patient to use the injured joint, thus allowing it to resume normal action, when it frequently recovers more promptly than if the patient remained idle. As stated, we must consider the financial condition of the patient. Very few railway employes are wealthy, most of them, in fact, live a hand-to-mouth existence; by the time one pay day rolls around all the money that is coming to them is needed to pay last month's bills, sometimes a little bit more is needed, as we have reason to know. Every day that the patient lays off increases his debts and decreases his assets. He commences to worry and fret, and we know what that means in the treatment of either disease or injury. A man with a discontented mind cannot recover properly.

The question from the point of view of the welfare of the company is important also. I believe that no better illustration can be found of the old saying as to "Satan finding mischief for idle hands to do," than is to be found in the case of an injured employe who is lying idle. When he is first injured he thinks only of recovering from his injury and resuming work. The next day he commences to feel a little bit hard toward the company because the injury is serious enough to prevent his working, probably within an hour or two after he returned home some good neighbor comes in and puts the thought into his head that he ought to get something out of it, no matter how trivial the injury may be. He does not entertain the notion at first, but in a day or two his debts commence to pile up, the assets have decreased, and he begins to scheme how he can get something. And more trouble, I believe, is caused to the Claim Department through the fact that the men have to lie idle for a greater or less period of time, than from any other one cause.

It has always been my policy in the treatment of injured men at Burnside to encourage the foreman to give injured employes work of some kind, or to get them to promise in exceptional cases to let a man who really could do no work to come around and make a "bluff" at it, and I think that the results of that policy have been very good. The employes appreciate it. The man who is told that he can come back to work and draw his time is satisfied, and the great majority of them are under those circumstances ashamed to make false claims, they haven't the face to do it. There is, I believe, nothing which will discourage the making of false claims as much as to permit a man to come in and perform light labor, even, as stated, in exceptional circumstances where a man's financial condition is very bad, letting him make a "bluff" and put in his time. Most foremen are very humane, few of the employing officers of a company are, I have found, nearly so hardhearted as they have been pictured—that all they want is to get so much work out of a man, and the man who can do the most work is *the* man, and when he cannot do his work kick him out; that policy is not nearly so common as some would lead us to believe.

Now, under what circumstances should a man be permitted to resume work? The questions has been raised on several occasions as to whether a man should be permitted to re-

sume work without first obtaining a certificate from the attending surgeon. I know of no objection to compelling a man to have some sort of an O. K. from the attending surgeon, and it does seem to me that there are a number of circumstances in which it would be a very wise thing. Chicago is the hotbed of the personal injury business, and the particular section in which I live is, I believe, about the worst in the whole city. I have had brought to my attention a dozen fraudulent cases against corporations other than the Illinois Central, for injuries received while in the employ of that road, and which injuries had been treated by me, and undoubtedly many cases have been brought against the Illinois Central for injuries received in the employ of other corporations. In most of these cases where suits were brought against other corporations, as soon as the claimant or his attorney became aware that the defendant had knowledge of his having been treated for the Illinois Central, and had knowledge that this man was seen at the time he recovered or left the cripple class, and his condition was known, the suit was dropped. Now, if these injured men and their attorneys know that we have a record of their physical condition at the time they were discharged from our care, it will very, very often relieve the company as well as ourselves of a great deal of after-trouble.

DISCUSSION.

Dr. D. T. Martin, Pomeroy, Iowa: If Dr. Henley's paper was any better than his talk I would like to have heard it. I am sure that the points he has brought out are the very things we are coming in contact with almost every day; but there is one feature of this ques- that appeals to me, and Dr. Henley will recognize it. Sometimes we are asked, Why has the patient been in the hospital eight weeks? or, Why hasn't he been out to work? I have had that put to me, and perhaps the doctor has. I think we should give the patient time to entirely recover, and the class of patients coming to my mind particularly are the men like brakemen who get a finger pinched or a nail in the foot, and insist on the wound being dressed and going back to work. Those men are in the financial condition stated by the doctor—they haven't a month's wages.

I recently had a case where a brakeman on a freight train came to me with the forefinger mashed. He insisted on my dressing that finger and going to work and reporting to the surgeon at the end of the division, which I permitted him to do, and about a week after that he came to my town on a through stock train on which he had been running for about a week, came over to my office and said: "There is something wrong with me, I can't chew tobacco; I think I have tonsilitis." He had a beautiful case of tetanus. I kept him eight weeks, and used 6 packages of antitetanic serum before I got through with him. The class of patients who report slight injuries should, I believe, laid off, especially those who work around stock trains, and be attended to as extreme surgical cases. For instance, in case of punctured wounds produced by stepping on a nail, the wound should be opened, treated and drained, never allowing a patient of that character to go home without thorough surgical treatment. I now use iodin altogether in these cases and have had better success than when I used carbolic acid, in almost every case having no after-trouble. It is the ideal treatment.

Dr. H. C. Mitchell, Carbondale, Ill.: I like very much what Dr. Henley has said in regard to these cases because I know it comes from wide experience, as he has charge of the surgical work in the Illinois Central shops at Burnside, and, therefore, has many cases to treat. But I think it would be a dangerous precendent to leave this door wide open.

I think we all have to select our cases because we know that a great many patients would be greatly injured by being allowed to go to work too soon. But, treating as many cases of that sort as we are called upon to do, we ought to be able to select cases and know those that would be injured by being allowed to go to work too soon. We should, in my judgment, be very careful about those things. because if the patient should go to work immediately under the instruction of the surgeon, in the event of his going on the witness stand afterward it would be harmful to the company.

On the other hand, we know that where patients are allowed to remain away from work and be idle too long, Satan does find mischief for idle hands. His friends will say: "You have a bad hurt; if I were you I'd bring suit." It is not very hard to get a thing of that kind going. I have in a few instances let cases go a little too long, in consequence of which suit was brought. Had I let them go to work sooner it would have saved the railroad company litigation.

Dr. Henley (closing): In bringing up this subject I refrained from giving the only rule I can give in regard to delay, and that is I feel we are justified in keeping a patient from working only in those cases in which we believe that his injury would be aggravated by resuming work, and that one exception should, of course, be evident to all of us without calling attention to it.

As for saying that a man with a certain injury should resume work in so many days and that a man with another kind of injury in so many more days, we should do as Dr. Mitchell says, make each case a rule unto itself. We cannot formulate any fixed rule as to the period that shall intervene before a man is permitted to resume work. We can only adjust this from our experience, and our experience should enable us to determine in the great majority of cases when it is safe and when the injury would not be aggravated by the patient resuming work. Therefore the only rule that I can suggest is that when you are convinced the injury will not be aggravated by the employe resuming work, you are hardly justified in keeping him out and depriving him of wages and stirring up trouble generally.

Any form of hernia must be looked upon as a dangerous lesion—at least in a potential sense, but an irreducible one more than a reducible. All irreducible herniæ, are particularly liable to inflammation, and certain of them to obstruction. Strangulation is by no means uncommon in non-reducible protrusions, but does not occur with the frequency which it might be expected. Probably, other things being equal, the younger the patient, the more serious in reality is an irreducible hernia.—*Eccles.*

THE DIAGNOSIS AND TREATMENT OF COMMONER INJURIES OF THE EYE.*

WILLIAM E. GAMBLE, B.S., M.D., CHICAGO.

My experience with the general practitioner and the surgeon leads me to believe that they would gladly wash their hands of the treatment of eye injuries. This mental attitude is partly owing to the fact that they may not, in some cases, take sufficient time and care in making the diagnosis, and, therefore, feel uncertain as to the real condition of the eye; but more especially it is because occasionally from the most trivial injuries the most disastrous results follow. This is especially true of injuries of the cornea which, from its exposed position and from its peculiar anatomic construction, being without blood vessels, and from the necessity for its perfect transparency, becomes the chief seat of danger to the patient's sight and the source from which malpractice suits and suits for damages arise.

This tissue, when punctured by a clean instrument, as, for example, in cataract extraction, has great reparative power, and but a few days are required for the healing process to take place; but add to the injury the factor of infection, and this tissue, of all tissues in the body, is least able to take care of itself. This is especially true when the injury, however trivial, is in the center of the cornea, being farthest away from the blood vessels about its limbus, for here the bacilli and cocci can work the greatest length of time unhindered by the action of the white blood cells which come from the distant capillaries, the result being scar formation —leucomata—which materially lessens its transparency; or the eye may be completely destroyed by the infective process.

It is very difficult, if not well-nigh impossible, to make a careful study of the cornea when it is injured, without the assistance of a corneal loupe, a condensing lens and a stain of some sort, because the patient from photophobia

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screws the lids together. A Coddington loupe is commonly used. I prefer the Berger bifocal loupe. A 14 D. to 20 D. lens is well suited for condensing light on the cornea—oblique illumination; I use a 2 per cent solution of fluorescin made neutral by bicarbonate of soda. By dropping this solution into the eye and allowing it to remain for five minutes the least loss of epithelium—abrasion of the cornea—will be shown by the presence of a green stain. A 4 per cent solution of cocain used a few minutes before using the stain increases its staining qualities. Often it is unnecessary to use the loupe, but always the condenser, focusing the light carefully over the cornea. These unrecognized abrasions are the most frequent cause of ulcers of the cornea. Especially is this the case when blennorrhea of the lacrymal sac is present. It is here especially that the old adage, "an ounce of prevention is worth a pound of cure" applies, for from the excessive pain these patients come to you as soon as they can get to the office, so you see them clearly.

Proper irrigation to cleanse the conjunctival sac, and a protective bandage, keeping the eyeball still and thereby preventing mechanical interference with the proliferation of the epithelial cells over the denuded area will, in twenty-four to thirty hours, effect a cure; while without a bandage it will take several days for the epithelia to cover over the denuded surface, and in the meantime the danger of infection is very great, with the untoward results, ulcer of the cornea and scar tissue formation later, and consequently more or less permanent loss of sight.

FOREIGN BODIES IN THE CORNEA.

Especially small particles of glass or stone may occasionally remain undetected without the aid of this stain. The epithelium around the foreign body being disturbed, will take on the stain, while the foreign body itself remains as a black spot, and with the aid of the loop and condensing lens one will have no difficulty in seeing it. The nature of the foreign body can usually be determined by the history of the patient's occupation at the time of injury. If it is a particle of woody fiber or other substance that has been blown in by the wind it can usually be removed without further disturbing the epithelial layer by means of cotton tightly wound about a toothpick. After cocainizing the eye with a 4 per cent solution, the end of this cotton-wrapped toothpick rubbed gently over the foreign body usually enmeshes it and it easily comes off.

Cinders blown from the smoke stack and pieces of metal thrown off by the emery wheel become fixed in the epithelial layer. These, after being definitely located and the eye cocainized, can best be picked out by aid of a cataract needle or spud that is not too sharp. This operation should only be done with the aid of the loupe, as in this way the least disturbance of the epithelia about the foreign body can be obtained. These particles when thrown off are sterile, having been rendered so by heat, and if left to themselves often slough out without further danger to the cornea other than the traumatism. Commonly the meddlesome interference of a fellow-employe with his jackknife or some other infected instrument renders this comparatively harmless traumatism into the much dreaded ulcer.

It might as well be stated here that the prognosis in injuries of the cornea, however trivial, should be very guarded, and yet not more pessimistic than the facts warrant, which can only be determined by careful study of the cornea as here indicated. Extreme optimism is never warranted. Infection may occur at any time or may take on malignant activity at any time, for we are not only handicapped by the weakness of the cornea against microbic invasion, but we are unable to use many of the means of modifying the growth of microbes or destroying them, for the reason that solutions sufficiently bactericide to have this effect disturb the nutrition of or destroy the epithelial layer itself, and therefore offer a pabulum upon which germs feed. Solutions in the main are used for the purpose of irrigation. A half-saturated solution of boric acid or normal salt solution will best answer that purpose. After removal of the foreign body and irrigation as above indicated, the protective bandage should be applied and kept on the eye until the denuded spot will no longer take on the stain, which shows that the abraded spot has been covered with epithelia

and therefore has no need of further treatment.

HYPOPION ULCER OR SERPIGINOUS KERATITIS.

While the sterile particles embedded in the epithelial layer of the cornea are comparatively harmless when properly treated, masons and laborers tearing down old buildings, often receive small particles in the eye which cause hypopion ulcer, one of the most formidable eye diseases with which we have to deal, usually resulting in total destruction of the eyeball. The malignant type of this disease is almost universally due to pneumococci, while the less severe type is due to streptococci. This condition is usually found in patients of lowered vitality from bad habits or poor surroundings, and is commonly found among day laborers.

Clinically it presents a picture that is characteristic: history of a foreign body in the eye a few days before, usually in the center of the cornea, a crescentic infiltration seen about the site of the ulcer, now developed, which spreads and spreads until the whole cornea sloughs away. Hypopion is commonly seen early. This same condition is seen in workers in the harvest field, the awns of beards of grain producing slight abrasions of the cornea and furnishing the infection atrium. It is in these cases that the surgeon should be particularly careful in making a prognosis and should promptly institute the most painstaking treatment. In addition to carefully removing the foreign body profuse irrigation with warm boric solution should be used and the protective bandage applied. I instill a 1 per cent solution of atropin and try to see the patient for the next five or six days.

If ulcer develops following such injuries, I cauterize with 95 per cent carbolic acid, applied with the thinnest layer of cotton on a toothpick. If this does not stop the ulcerative process the actual cautery should be used. This will probably be the most effective remedy. Saemisch instituted what is known as the "Saemisch incision," which has the disadvantage that there is incarceration of the iris in the wound, and the further disadvantage that the cornea is greatly weakened and even if the healing process does take place promptly there is often later anterior staphyloma of the whole cornea, necessitating enucleation of the eye.

DEEPER INJURIES OF THE CORNEA AND CONJUNCTIVA.

Superficial injuries of the conjunctiva, unless there is considerable loss of tissue, are of but little importance, for they readily heal and scarcely require the aid of a suture. Foreign bodies in the conjunctival sac can be easily removed by inverting the upper lid and wiping off the foreign body with cotton. Powder grains can best be removed by cutting them out with small scissors.

Burns of the cornea and conjunctiva are of frequent occurrence and, with the exception of strong ammonia fumes, etc., may cause a lesion deeper than the epithelial layer, and consequently result in scar tissue formation in one or both tissues, producing more or less adhesion of the eyelid to the globe, a condition which greatly weakened and even if the healing process the eyeball renders it irritable. Usually these cases come to us so late that we are unable by chemical means to retard or destroy the caustic action of the burning agent. If we see the patient soon enough in cases of burning by mortar, oil can be used to irrigate the conjunctiva, but practically I have seldom seen a case soon enough to be worth while to use the oil irrigation. Irrigation with a fairly strong stream of water, flushing out and mechanically displacing the particles of lime and mortar, and picking out those that do not wash away is the best means of getting rid of the offending substance.

The use of cocainized vaselin is very grateful to the patient for the first twenty-four hours. Cold compresses tend to relieve the pain. After the acute pain has subsided, sterilized vaselin is placed in the conjunctival sac twice a day. Atropin, of course, is used when the cornea is involved. Similar treatment would be indicated in burns from other causes. The recovery in these cases is very slow, requiring weeks and sometimes months for complete repair. The symblepharon resulting may be partial or very extensive, depending on whether or not the burn extended into the cul-de-sac. Until recently the repair of extensive or total symblepharon was beyond the surgeon's art. The credit for working out a successful operative procedure

belongs to F. C. Hotz. By use of Thiersch grafts and lead plates—"block tin"—this deformity is relieved.

PERFORATING WOUNDS OF THE EYEBALL.

While we have seen that superficial wounds of the cornea are very prone to produce infection of the cornea, perforating wounds are almost immune from this complication, which may be accounted for by the fact that the outrushing aqueous humor washes away the *materies morbi*, while a perforation of the sclera by the same instrument would cause panophthalmitis, this being due to the fact that the infecting material is not washed out and the vitreous forms a good culture medium. However, while in perforating wounds of the cornea the eye frequently escapes infection, yet it suffers frequently from injury to the lens, producing traumatic cataract, or entanglement of the iris in the wound, prolapse of iris, which necessitates prompt and heroic treatment, for this vascular tissue, extending from without the eyeball, forms a bridge for the passage of the infective material to the interior from which the eye may suffer secondarily.

In perforation of the sclera, attempts should never be made to suture the sclera itself. Clip off the protruding bead of vitreous and suture the conjunctiva over the perforation in the sclera. Traumatic cataract can usually be satisfactorily treated by keeping the eye at rest by a bandage and the use of atropin. It occasionally happens that so great swelling occurs in the lens that glaucoma supervenes, when the lens material must be removed by incision in the cornea to save the eye from the disastrous results of this complication.

In cases of prolapse of the iris, if the patient is seen within a few hours after the injury, the following operative procedure should be at once instituted. After thoroughly irrigating the conjunctival sac and cocain applied, the prolapse should be separated by a thin spatula from the grasp of the corneal wound, and with a pair of iris forceps the iris should then be pulled out about ⅛ inch and with one stroke of the scissors the protruding part should be snipped off, allowing the remaining iris to fall back into the anterior chamber in its natural position. If the patient is not seen until thirty-six hours or more after the injury, the prolapse at that time is thoroughly bound down by inflammatory exudate and it is not then advisable to reopen the wound, as many cases have been reported in which panophthalmitis followed this later reopening of the wound. When inflammatory complications follow in these cases they are usually of the acute type and come on within the first week.

Perforating injuries in the region of the ciliary body, that is, ⅛ inch back of the limbus of the cornea, are always of serious import to the injured eye, for to the danger of panophthalmitis may be added the results of the injury to the ciliary processes, the vital organ of the eye, which may result in permanent reduction in tension with consequent shrinking of the eyeball, and thereby complete loss of vision. While there is danger of sympathetic ophthalmia resulting from perforations of any part of the eyeball, yet experience has taught that perforating wounds through the ciliary body, and especially if the iris or ciliary body prolapse, is by far the commonest source of this much dreaded complication. Enucleation is to be advised in perforation through this region by a blunt instrument producing much destruction of tissue with loss of sight. It often forms a knotty problem for the surgeon to know how to treat injuries of a lesser degree, with the preservation of useful sight. It is not now opportune to discuss this in detail, as I think the responsibility in these cases should be left with the ophthalmologist.

I think it should be emphasized in this connection that the inflammatory process in the offending eye that leads to sympathetic ophthalmia in its fellow is not, as a rule, of the acute type, but is a low-grade inflammatory process, which is almost universally accompanied by tenderness on pressure of the offending eye. It is seldom that foreign bodies become encysted in the eye and therefore of no further danger to that organ. I have seen examples of foreign bodies in the lens remaining for years without any untoward results except in the lens. Besides such mechanical irritation as is caused by non-oxidizable particles in the eye there is

added the danger of chemical decomposition which takes place in the iron, steel and copper particles, and are most harmful when the body is lying in the region of the ciliary body. It is scarcely needful to say that in every case the foreign body should be removed if possible, and if not possible that the eye should be sacrificed.

In conclusion I wish to call your special attention to the great value of the Haab, or giant magnet, in removing magnetizable particles from the eye. In a large percentage of cases these chips of iron and steel can be removed from the eye by the Haab magnet with a resulting useful eye, if the patient is seen early. In all cases where the eyeball is not destroyed by the piece of steel or other magnetizable substances the magnet should be tried. Usually the presence of the foreign body in the eye can be determined by the reaction of the magnet upon it. A feeling of pain when the magnet is held close to the eye is produced, which is evidence that the foreign body is in the eye. In cases where the particle has been in the eye for several days we may not get this reaction, and in such cases a radiograph should be made to determine whether it is present or not. There are comparatively few of these magnets in this country. So far as I know, Chicago has but 2. Much to her discredit, this city has secured these only within the last five years.

The general hospital of every large industrial center should possess one, and the attending ophthalmologist trained in the use of this valuable instrument, for a large per cent of the victims of these injuries are financially unable to go to the ophthalmic hospitals in the large cities for treatment, and in many cases their eyes are therefore unnecessarily sacrificed.

DISCUSSION.

Q.: Heretofore in discussions in societies there has been objection to solution of cocain, some believing that strong solutions of cocain have a tendency to destroy the epithelium of the eye. What is your opinion?

Dr. Gamble: I think that is in a sense well founded. I do not recommend cocain in the eye. I never use cocain as a therapeutic remedy only when demanded for operation, or after a burn of the eyeball, when we apply cocain in vaselin for the first twenty-four hours. Other than that it has no value and is harmful. The same can be said of holocain. Cocain is not an agent to be used indiscriminately day after day.

Q.: If a patient has a substance in the eye which renders it very sensitive, is there any objection to using it temporarily until you get the substance out?

Dr. Gamble: No, no objection at all.

FRACTURES OF THE SPINAL PROCESSES.

Sauer writes that these fractures occur most frequently in soldiers, mine workers and laborers. They are usually caused by forced muscular action. The gunner on lifting the trail of a gun carriage, the laborer on swinging a loaded shovel, experiences a sudden stabbing pain in the back. The pain recurs with every movement of the arms and makes working impossible. The subjective symptoms are all out of proportion to the objective findings. The examining surgeon usually attaches little importance to the assertions of the patient, and is often satisfied with a probable diagnosis of muscular rheumatism or spraining of the muscles, etc., and may even suspect malingering. Injustice is often done to a patient on account of a superficial examination and insufficient attention to his complaints. The diagnosis of a fracture is not very difficult. The history of a cracking noise, and the circumstances under which a severe pain occurred suggest at once the proper diagnosis. Crepitation is often hard to obtain on account of the contraction of the muscles. If the surgeon lets the patient lie down comfortably, and places the palm of his hand against the back of the patient near the seat of the pain, he can, as soon as complete relaxation has taken place, push the fragment from side to side, upward or downward and press it against the fixed position of the spinal process like the key of a piano. The treatment consists of rest in bed.—*Military Surgeon.*

The Railway Surgical Journal

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Subscribers not receiving their Journal regularly will confer a favor by reporting the non-receipt to the editor.

ANNUAL MEETING.

The fifth annual meeting of the American Association of Railway Surgeons will be held in Chicago, October 14, 15 and 16, 1908.

BY-LAWS OF THE A. A. R. S.

In another part of this issue will be found the by-laws with all revisions and amendments up to the present time.

PROMOTION OF DR. PLUMMER.

Dr. S. C. Plummer, chief surgeon of the Rock Island System has been promoted from the chair of Surgical Anatomy and Operative Surgery in the Northwestern University Medical School, to that of Clinical Surgery.

A NOVEL CLAIM FOR DAMAGES.

A man in New Jersey has brought suit against a trolley company for $10,000 damages. Although 73 years of age, he was an amateur "bug hunter" and asserts as a result of an accident he has been unable to pursue the festive grasshopper and the lowly June bug, thereby being deprived of a pastime. "And your petitioner further prays," etc.

NEWSPAPER "FIRST-AID."

The following appears in a recent issue of the Chicago *Tribune:*

COBWEBS FOR WOUNDS.

If a cut, scratch or wound of any kind bleeds profusely, bind the bleeding part with cobwebs and brown sugar pressed on like lint. Or, if these are not available, use the fine dust of tea. When the blood ceases to flow apply laudanum.

This looks as though there was some need for the proposed department for education of the laity to be inaugurated by the American Medical Association.

Crutch palsy is due to the pressure of a crutch on the musculo-spiral nerve. It is best avoided by well padding the crutches, or by having handles to the crutches, so that part of the weight falls on the hands. The paralysis, which chiefly affects the extensor muscles of the forearm, giving rise to *dropped wrist,* usually passes off when the crutch is no longer used. Should it not do so, electricity and massage may be employed.—*Walsham.*

Miscellany.

BY-LAWS AMERICAN ASSOCIATION OF RAILWAY SURGEONS, 1908.

ARTICLE I.

Section 1. The name of this Association shall be the American Association of Railway Surgeons.

Sec. 2. The objects of this Association shall be the promotion of the best methods of developing and improving railway surgery by the interchange of ideas through the reading and discussion of papers in convention, and their publication in the official journal, and the cultivation of acquaintance and fraternal relations among those actively engaged in this special work.

ARTICLE II.

Section 1. The members of the Association shall consist of three classes—Honorary, Executive and Associate members.

Sec. 2. Honorary members shall be persons more or less distinguished as railway surgeons, or other persons who have performed valuable services for the Association. All nominations for honorary membership shall be approved by the Executive Board and balloted upon by the Association in executive session.

Sec. 3. Executive members shall be limited to 200 and shall consist of such active railway surgeons as may be deemed qualified and worthy. Applications for executive membership shall be made in writing in regular form, recommended by three executive members, and upon approval by Executive Board shall be balloted upon by the Association in executive session. Three-fourths of the members present shall be required to elect.

Sec. 4. Associate members shall consist of all such active railway surgeons who are in good professional standing. This membership shall be represented by delegates who shall have all the privileges of the meeting except that of voting in executive session. The same privilege shall be extended to other associate members who may be in attendance at the meeting. Each company organization or surgical staff shall be entitled to select delegates on the basis of 5 per cent of the surgeons employed.

Sec. 5. Executive members shall be dropped by the Treasurer from membership when two years in arrears for dues.

Sec. 6. An executive member may be expelled from the Association for the misappropriation of funds, or for actions unbecoming a railway surgeon and a gentleman. All charges must be preferred before the Executive Board and there recommended for approval or disapproval by the Association in executive session.

ARTICLE III.

Section 1. The officers of this Association shall consist of a President, three Vice-Presidents, a Secretary, a Treasurer, an Editor and six Executive Members, who, with the President, Secretary and Treasurer ex-officio, shall constitute the Executive Board.

Sec. 2. The President shall be elected by ballot. The remaining officers shall be proposed by the Nominating Committee. All officers shall be elected annually, except the members of the Executive Board, who shall hold their offices for three years, two being elected each year.

Sec. 3. The election shall be in order in executive session on the third day, a majority of all votes cast necessary to elect, and after the second ballot, if no election, all but the two receiving the highest number of votes shall be dropped and the ballot confined to the two so designated.

ARTICLE IV.

Section 1. The President shall preside at all regular and special meetings and perform all the other duties that custom and parliamentary usage may require.

Sec. 2. In the absence of the President, the Vice-Presidents shall perform the duties of his office in order of seniority.

Sec. 3. The Secretary shall keep a record of the proceedings of all meetings and draw all orders on the Treasurer for the payment of bills, shall attend to all correspondence of the business of the Association and shall be ex-officio a member of the Committee on Arrangements.

Sec. 4. The Treasurer shall have immediate charge of the funds and property of the Asso-

ciation, shall collect all dues, giving his receipt therefor, pay out money only on the order of the Secretary, countersigned by the Chairman of the Executive Board, and shall give bond to faithfully account for all funds coming into his possession belonging to this Association, the amount of the bond to be determined by the Executive Board. He shall also make a written statement to the Association at the annual meeting and to the Executive board at such other times as the President may request.

Sec. 5. The duties of the Editor shall be those ordinarily pertaining to such an office. He shall edit all the papers and discussions and see that they are published as directed by the Association. He shall act as a member of the Publication Committee, consult with said committee regarding the publication of any paper or discussion submitted to him for publication, assist in securing papers for each annual meeting, and the proper arrangement of the same on the program, and also such other duties as may be assigned him by the Committee on Publication.

Sec. 6. The Executive Board shall fix the annual dues and membership fee, subject to the approval of the Association, and act as a Committee on Credentials, audit all accounts, act as a Committee on Transportation, and hold any necessary meetings in the interval between sessions deemed desirable and necessary in the interests of the Association, and such an action shall be deemed an action of the Association as a whole.

It shall also have the power to make such arrangements as may be necessary for the editing and publishing of the Association journal. It shall fix the salaries of all officers.

ARTICLE V.

Section 1. The regular committees shall consist of:

1. A Committee on Nominations consisting of one representative from each railroad system having executive and delegate members in attendance at the annual meeting. The several railroad systems selecting their own representative on the Nominating Committee.

2. The President shall appoint a Judiciary Committee of nine members to serve three years, three to be appointed each year.

3. The President shall appoint a Committee on Arrangements for each annual meeting.

Sec. 2. Special committees may be provided for at the pleasure of the Association.

Sec. 3. The Committee on Nominations shall present the names of three members for Vice-Presidents, one Secretary, one Treasurer, one Editor and two members of the Executive Board.

Sec. 4. The Judiciary Committee shall consider and report to the Association, in executive session, all laws and matters of a legislative nature referred to it.

Sec. 5. The President, Secretary, Treasurer and Editor shall constitute a Committee on Publication, to which shall be referred all papers, discussions, reports and other matter suitable for publication by the Association.

Sec. 6. The Committee on Arrangements shall have charge of the arrangements for the annual meeting.

ARTICLE VI.

Section 1. The annual meeting shall be held at such time and place as shall be designated by the Executive Board. The session shall continue three days, or until all the business of the Association is completed and a formal adjournment had.

Sec. 2. An executive session for the transaction of business shall be held in the morning of each day of the annual meeting, none but executive members being present.

ARTICLE VII.

The order of business at the annual meeting of this Association shall at all times be subject to change by a two-thirds vote of the members present. It shall be as follows:

Executive Session:

1. Call to order.
2. Reading of minutes of previous meeting.
3. Reports of committees and officers.
4. Report of Executive Board.
5. New and unfinished business.
6. Nomination and election of officers on third day.
7. Adjournment.

General Session:

1. Call to order.

2. Reading of minutes.
3. Report of Committee of Arrangements.
4. Reading and discussion of papers.
5. Adjournment.

ARTICLE VIII.

Section 1. The members present at any regular or executive session shall constitute a quorum, and the majority vote shall decide all questions unless otherwise provided for.

Sec. 2. The rules of conducting business shall in all cases, as far as they are applicable and not incompatible with the by-laws of this Association, be those in Roberts' Rules of Order.

ARTICLE IX.

Section 1. The annual dues shall be:

For the executive members.....$5.00
For the associate members..... 2.00

ARTICLE X.

Section 1. All amendments or alterations of these by-laws shall be proposed in writing and referred to the Judiciary Committee, which shall report thereon at the next annual meeting unless otherwise instructed by a two-thirds vote of the Association in executive session.

Sec. 2. Reports of Judiciary Committee shall be acted upon in executive session, a two-thirds vote deciding.

Translations

TRAUMATIC RUPTURES OF THE ARTERIES.

BY P. PICQUET, M. D.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

Traumatic ruptures of the arteries are met with under various conditions. Sometimes they are produced by direct attrition, when the force is brought to bear directly on the course of the vessel; such is the case with gunshot wounds and in the serious contusions resulting from crushing and pulpefying of the limbs. Owing to the considerable violence thus brought into play concomitant lesions of the soft parts, the bones and the joints are produced at the same time.

In other cases they occur at some distance from the point traumatized; such instances are necessarily accompanied by fractures or dislocations, since a kinking or dragging of the vessel is a preliminary requisite, and any external violence tending to produce the latter, must first overcome the resistance offered by the bones and joints.

Lastly, arterial ruptures may follow too sudden or too extensive movements and severe strains.

They are produced by the following mechanisms: Tearing, crushing, bursting, which act either singly or combined. The most important of them all is tearing, in the first place because it comes into play in all cases, next because it has the most influence.

No matter how diverse the cause of these arterial ruptures and the complexity of their mechanism, it is possible to study them all from a double point of view.

Anatomically, whatever the mechanism, one fact is constant—the internal tunic is the first to give way. The lesions always commence in the intima, when the adventitia is not involved, the rupture is incomplete; when the adventitia is also torn the rupture is complete. Secondary obliteration of the vessel is the rule in the incomplete variety. Obstruction of the vessel is also possible in the complete ruptures, or—as is more often the case—hemorrhage occurs and leads to the formation of a hematoma.

Clinically, these arterial ruptures establish a remarkable analogy between traumata which, otherwise, are totally different. Given a contusion, a fracture or a dislocation, complicated by rupture of one of the large arteries, the latter dominates the situation, by reason of the grave sequelæ which soon follow—gangrene and mutilation from a local, septic complication and infection from a general point of view. It is of great interest, then, to recognize the signs of circulatory arrest which enables us to diagnose this dreaded complication in all cases: Disappearance of the arterial pulse below the point wounded, pallor and coldness of the injured limb, loss of sensation, paralysis of the ischemic muscles.

The prognosis is extremely grave, recovery is possible when the circulation is re-established through collateral channels. This, however, is exceptional and always incomplete, the atrophy of the muscles, the permanent edema of the

whole limb, preventing complete restoration of function.

Gangrene is the usual consequence of arterial rupture. In some cases it is of the moist variety, spreading, with grave general symptoms; in others it is dry and circumscribed. It is explained by the extensive thrombosis of the main vessel, by the alteration of the collateral branches, by embolic fragments thrown into the peripheral arteries, and finally, in many cases, by the presence of a hematoma, which may exercise compression on the whole circulatory system, and sometimes to a considerable extent.

Treatment, in spite of the diversity of the clinical aspects, is subject to general rules. Apart from cases of septic complications, menacing the life of the patient at once, immediate amputation and disarticulation should be refrained from. To operate during the initial phase of shock or during the period of lessened resistance which follows it, is to condemn the patient to almost certain death; moreover, primary intervention calls for too large a sacrifice of tissue.

The first care of the surgeon should be to carefully disinfect and wrap up the wounded limb. In most cases nothing more need be done; every more complex operation—suture, resection of the vessel, even ligature—is always useless and in many cases dangerous. Only the presence of an extensive crushed area and an abundant effusion of blood will justify operation, and this should consist merely of incising the hematoma and evacuating its contents. If there is no bleeding, it will be utterly useless to search for the wounded vessel with a view to ligating it. Of course, should hemorrage recur ligation will naturally be resorted to.

Later on, if infectious phenomena become menacing amputation will be called for; when such phenomena have disappeared and when the line of demarkation has become definitely established, the time for secondary operations is at hand.—*Gazette des Hopitaux.*

The methods of *skiagraphy* are useless for the routine detection of gall stones, and those who have tried the method extensively are the most convinced of its uselessness for this purpose.—*Bland-Sutton.*

Extracts and Abstracts.

THE CLAIM AGENT AND THE PSYCHASTHENIC.

FRANK R. FRY, A. M., M. D., ST. LOUIS, MO.

Within the last few years I have not infrequently noted the intelligent manner in which officials of railroads and other corporations have approaching patients in psycopathic states following the shock of accidents, a pleasing contrast to earlier experiences in this line of work.

We all know the advantages of a clear understanding between those who on the one hand have the professional care of these patients and the claim agent on the other hand. By the term "claim agent" I would here designate not alone the official who has specific duties of this kind, but any one, physician, attorney or other person authorized to negotiate the settlement of the patient's claim for damages from bodily injuries.

The object of my paper is to notice the psychic side of this subject and this I shall do by trying to set forth as briefly as possible the actual psychic, or psychopathic, state of many of these cases.

In my title I have used the work psychasthenic. I will not stop to define it or to haggle on the use of it and similar terms. I may use it, at least as a convenience, to comprehend the states of mental demoralization in which we often find patients after some shock. We readily recognize the more usual groupings of these symptoms: The mental asthenia, an incapacity for sustained mental effort of any kind, with its indecisions, doubts and obsessions; the phobiac state, a moral asthenia, an unconquerable fear of everything and of anything—often in this particular class of cases a hypochondriac fear, the patient fearing that as a result of the accident irreparable bodily damage has been done; confusional states, which the patient can not describe and does not convey as readily as he does the above states, but which are very distressing and often hysterical in character.

Of course the lines which separate these groups must not be drawn too exactly. In fact, the only advantage in grouping this kind of symptoms at all is that we may more readily describe and recognize them and as soon as possible gain a common understanding of them. Some of us, physicians and others, seem to almost instinctively grasp these situations. Others of us, physicians or not, seem to have temperamentally but slight comprehension of them. On this observation I think we should lay considerable stress, and keep it in mind when associated with others in these cases.

It is the first duty of physicians and of officials of all kinds dealing with this class of patients to recognize the condition as well as possible, and secondly to employ the best means of overcoming it. It is evident that not only the patient's interests demand a cure as early as possible, but the interests of the liable parties are best guarded by the same prompt relief. First the recognition, or diagnosis; for the trained neurologist it is not difficult. The trained general physician, if he has carefully observed his case, makes a proper diagnosis, although he may not always express it in the same technicalities that the neurologist is in the habit of using. The chief criticism that the neurologist has to make of the general practitioner in this connection is his careless observation of these cases. By way of illustration I may mention a case:

Last June I saw with another physician a lady of 32 who had been in a street car accident. There was a general lameness of the whole right side with complaints of pain and parasthesia in the different members. This was accompanied with so many hysterical phenomena that he should have been led to the few sensory and other tests necessary to establish the hysterical character of the paralysis and anesthesia present. He had told the patient there had been a rupture of a vessel in the brain which had caused the condition and that the prognosis was not very good, which of course aggravated matters greatly. I am sure he was honest in his opinion. I only mention this instance because its counterpart is so frequently met with.

The man who takes the time to personally get on proper terms with this class of patients, whether he be a physician or not, can readily distinguish them from malingerers, and if he is able to put some additional thought to the matter he may further generalize that they are not always merely imaginative weaklings, but often persons of strong character and intellectual capacity temporarily in a pathologic-psychic state.

Secondly the relief or treatment. If one has a practical comprehension of the mental states of these individuals the important feature of the treatment suggests itself, namely, persuasion. The detail of this, however, or manner of going about, is a matter for most careful consideration. We must remember these patients are frequently in a state of perplexity and even consternation over their own condition. They continuously ask themselves whence this multiplicity of strange, often painful, mental and physical sensations and experiences. Sometimes they undertake to describe them to us. Often they find an incapacity to do so, at least until they are improved. It is a mistake and a bad one to go to a patient in this state telling him that there is nothing the matter of him, that he is all right if only he would think so. He regards the one who approaches him in this spirit as absurd or heartlessly mercenary. Persuasion as I have always said is the method of dealing with these cases; letting them see that we understand their disability that we are alert to investigate it, that everything shall be done to that end, that we have the best assurance that no bones are broken and that there are no irreparable lesions, that if they will be reasonably patient we can and will assist at every turn, that eventually they will safely regain their equilibrium. All of this may be done without the spirit or appearance of coddling.

It is very harmful and almost criminally careless to magnify to the patient in this state his injuries. We are often shocked to find them citing the authority of an attending or consulting physician to the effect that they have sustained some hideous brain or cord lesion. We should know how readily in their perplexity they adopt such suggestions and how they are harmed thereby. We must never lose sight

of their "suggestivity," which is usually pronounced.

For example a refined and intelligent woman fell from a street car a few months ago striking her head. She had a pain in her head that was troublesome and a paresthesia that was more so and she was becoming very weak all over. She was much concerned about her physical and mental condition. Her mother, twenty-three years ago, had fallen on the ice striking her head, and had been a mental wreck ever since. In great dread of a similar fate our patient went to a prominent surgeon whom she greatly esteemed. He told (?) her she might have a clot of blood on the brain and kindly advised her to consult me. The mother's history was sufficient to feed the flame of her fancy freely. The "clot on the brain" was almost a final stroke. It was next to impossible to persuade her that she had any chance of recovering (I mean her health, not damages). Permit me again to explain that I am reciting not an unusual case but a frequent experience for illustrative purposes.

Too often persuasive suggestions are prevented by the ignorant or designing coddling of physicians. It is the duty of the consultant whether employed by the claimant or defendant to argue or to shame this kind of a practitioner out of his harmful attitude to his patinet. Incidentally I may observe that contentions with a practitioner under these circumstances should, if possible, always be left to physicians. I have frequently observed that the situation is not eased by the efforts of professional claim agents or lawyers.

In these observations I am keeping in mind first of all the psychic welfare of the patient, the one essential that the practitioner must never lose sight of. If he would hold an intelligent relation in these cases, fair to all concerned, he must make the reasons for his position as evident as possible. As we all know, the discussion of this subject has been difficult for reasons that are evident. It does not seem to the writer many years past that it would have been a helpless task to have presented it in a way that would have been seriously accepted by a general medical audience. Experience here as elsewhere has been a practical instructor. We meet each other in these cases now on a much more comfortable footing and it is a satisfaction to say something commendatory of each of us, meaning by us, neurologist, general practitioner, lawyer and claim agent. Especially it is a pleasure to mention the latter in a complimentary way, for he is supposed to always be in need of human sympathy.

I hope I have, in a measure, made evident the fact that the neurologic side of the medical profession is keenly interested in this question, and willingly if permitted to take the lead in presenting ways and means for its solution, even to the extent of undertaking to instruct the claim agent.—*Kansas City Medical Index-Lancet.*

Personal

Dr. N. P. Howard, local surgeon for the Pennsylvania System at Greenfield, Ind., died on May 26, aged 52. The doctor was a faithful attendant at the annual meetings of our Association.

Dr. C. Howard Searle, local surgeon for the St. Paul System at Palmyra, Wis., was elected a delegate to the State Society at the recent annual meeting of the Jefferson County Medical Association.

KENTUCKY STATE ASSOCIATION OF RAILWAY SURGEONS.

The following officers were elected at the annual meeting, held May 12-13: President, Dr. C. Thompson, Louisville; vice-presidents, Drs. J. L. Phythian, Newport, H. P. Cartwright, Bowling Green and H. S. Chase, Junction City; secretary, Dr. J. B. Kinnaird, Lancaster; treasurer, Dr. Clarence H. Vaught, Richmond.

ASSOCIATION OF SURGEONS OF SOUTHERN RAILWAY.

The newly-elected officers are as follows: President, Dr. B. G. Copeland, Birmingham; vice-presidents, Drs. Henry T. Bahnson, Winston-Salem, N. C., and James H. Shorter, Macon, Ga.; secretary-treasurer, Dr. J. U. Ray, Woodstock, Ala.

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THE ANTIKAMNIA CHEMICAL COMPANY

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PUBLISHER'S DEPARTMENT

La Clinique of Paris (Nos. 32-5, 1907), calling attention to the fact that collargol would be discussed at the next Congress of Medicine in Paris, requested its readers for reports of their experience with the remedy, whether good or bad. Of the responses received (all of which were favorable), the following are cited:

Dr. Ruyssen had unguentum Credé inuncted repeatedly in a puerperal pyemia. Thereupon the lochia became copious and assumed the color of collargol solution, retaining it as long as unguentum Credé was used. Simultaneously with this phenomenon, which he ascribes to an excretion of collargol by the mucosa of the inner genitals, a progressive retrogression of temperature and rapid recovery ensued. He also reports a dangerous erysipelas, cured with the ointment.

Professor Jeanbrau has always seen success from a treatment of acute cystitis which he learned from Tavel in Berne, consisting of the daily injection of 2½ to 5 drams of 1 to 3 per cent collargol solution into the bladder. While silver nitrate injections are agonizing, collargol causes no painful reaction whatever. Moreover collargol more quickly inhibits the pain of the cystitic process and appears to have a more energetic action on the infectious cause. In chronic cystitis its action is less striking, as is the case with silver nitrate, since the causes (prostatic hypertrophy, etc.) continue. Here also collargol irrigations and injections are preferable, because of their painlessness.

Dr. Frère has for some years used collargol in all acute infections, to his satisfaction. He enumerates, as especially convincing, 3 cases,—a grippe with pronounced meningeal symptoms, a double broncho-pneumonia, and an acute articular rheumatism; in these the sequence of the change in the clinical picture upon the intravenous collargol injection, was particularly striking.

Other papers presented were good and at the conclusion the president thanked all present for the very enthusiastic manner in which each of the surgeons and the claim department entered into the work of the new association.

A vote of thanks was extended the Program Committee and also to the Commercial Club for the use of their most excellent rooms.

In favor of this method are the following points: First, comparative freedom from pain, especially at the time of dressing; second, no bleeding at time of dressing; third, it prevents exhaustion and probably eliminates this as a cause of death; fourth, healing is more rapid because the granulations are not torn off every time the dressing is changed; fifth, there is a smaller amount of contractures.

Any of these reasons alone would be sufficient to recommend it as a good method. If the death rate from extensive burns can be lowered, as I believe it can by eliminating exhaustion as a cause of death, it surely ought to be more

The only contraindications I could think of were that it might allow absorption of the pus which would accumulate underneath; that the surface of the wound being continually moist, it might be favorable to an overgrowth of granulations; and that the healing edges of the wound might become macerated and raw.

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this combination. After fevers, inflammation, etc., there frequently remain various painful and annoying conditions which may continue, namely: the severe headaches which occur after meningitis, a 'stitch in the side' following pleurisy, the precordial pain of pericarditis and the painful stiffness of the joints which remain after a rheumatic attack—all these conditions are relieved by this combination called 'Antikamnia and Salol Tablets' containing 2½ grs., each of antikamnia and of salol and the dose of which is one or two every 2 or 3 hours. They are also recommended highly in the treatment of cases of both acute and chronic cystitis. The pain and burning is relieved to a marked degree. Salol neutralizes the uric acid and clears up the urine. This remedy is a reliable one in the treatment of diarrhea, entero-colitis, dysentery, etc. In dysentery, where there are bloody, slimy discharges, with tormina and tenesmus, a good dose of sulphate of magnesia, followed by two antikamnia and salol tablets every three hours, will give results that are gratifying."

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Dr. Josef Bodenstein, Selzthal. (*Deut. Med. Presse*, Nov. 24, 1907.) In 32 cases of cystitis in both sexes, Bodenstein gave Arhovin (1 or 2 capsules 3 to 6 times daily), and an infusion of equal parts of herba herniariæ and h. chenopodium ambrosiadis (¼ to ¾ quart at each dose). Only in 4 of his 32 cases was the support of local treatment necessary. The results were brilliant; in 8 to 35 days most of the cases were cured or exhibited striking improvement. Within 1 to 3 days pain and tenesmus diminished and even urinary retention was favorably influenced. In 3 cases, catheterization, previously required, could be discontinued after a few days of arhovin medication. Urine with thick sediment of pus and mucus sometimes became entirely clear within 8 to 14 days; with the amelioration of the bladder difficulties the fever often disappeared on the second or third day; appetite improved, and intestinal irregularity ceased without any other measures. The effect, curative and analgesic, was astonishing because of its promptness, certainty and intensity.

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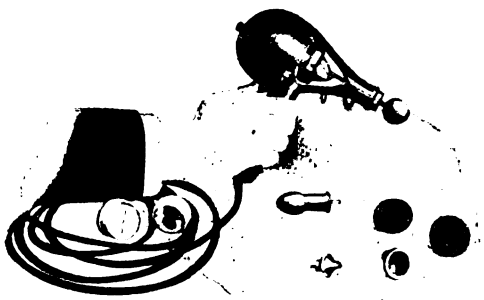

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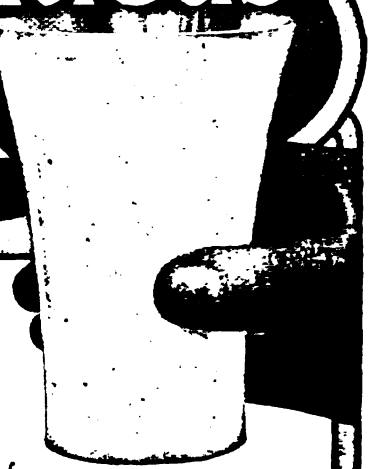

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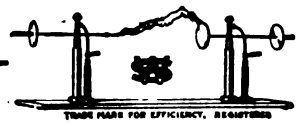

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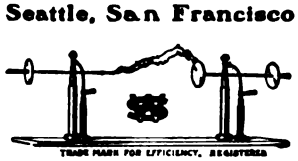

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THE Railway Surgical JOURNAL

VOL. XIV—No. 11 CHICAGO, JULY, 1908 WHOLE NUMBER 266

VARIOUS EYEBALL ENUCLEATIONS.*

FRANK ALLPORT, M. D., CHICAGO.

There is probably no important eye operation so frequently performed by the railway surgeon as a removal or enucleation of the eyeball. This operation is performed after severe eyeball injuries so extensive in character as to render the salvation of the globe impossible or at least extremely improbable.

The most susceptible or sensitive portion of the eyeball is what is known as the ciliary region. This is located at about the junction of the cornea and sclera, and involves the ciliary process. Perforating injuries in this locality are very dangerous, and should be regarded with much suspicion and a guarded prognosis. It may also be said that injuries in this region produce a majority of the cases of sympathetic ophthalmia, a disease which, while it should always be feared, is not nearly so frequent as is popularly supposed. It is, however, a very useful club to hang over the heads of stubborn patients, to induce them to have an eye removed when such procedure seems advisable. It should always be remembered that an eyeball is only good for two purposes; first, for visual, and second, for cosmetic purpose. When, therefore, it becomes evident that the vision of an eye is destroyed and that it is so mangled as no longer to be sightly, it is better to have it removed, especially when a badly injured eye may set up sympathetic ophthalmia with total blindness, for it must not be forgotten that, notwithstanding the fact that this lamentable disease is rare, it nevertheless does from time to time occur, is of most insidious development, and is practically impossible to stop, when once it has commenced. When, therefore, an eye cannot participate in the visual act, and is no longer an ornament, it is best that it should be removed, for various pathologic and degenerative changes are likely to occur to render it a menace to the safety of the other eye. What is the best method of eyeball removal, and under what conditions are the various methods to be used? There are four principal procedures for the removal of an undesirable eye:

First. The old-fashioned Bonnett operation.

Second. The modification of Bonnett's operation.

Third. Evisceration.

Fourth. Dr. Mules' operation.

The original Bonnett operation is performed as follows:

After the eye has been cleansed a speculum is inserted and the conjunctiva picked up near the sclero-corneal junction with a pair of strong forceps, and an incision, through the conjunctiva, is made which completely encircles the cornea. This incision should be made as close to the sclero-corneal junction as possible, in order to save all conjunctival tissue. The conjunctiva is then thoroughly separated from the eyeball with a pair of blunt, curved scissors, being careful not to cut the tendons during this portion of the procedure. The tendons of

*Read at first annual meeting Joint Association of Railway Surgeons, I. C., Y. & M. V., I. S. Railroads, Memphis, Tenn., February 27, 28, 1908.

the four recti muscles are then picked up with a strabismus hook and severed as close to the eyeball as possible. The speculum should then be forced into the socket, which will cause a forward movement of the eyeball, which is now, of course, only attached to the patient by the optic nerve, the two oblique muscles, and some loose connective tissue. An enucleation spoon is now passed back of the eyeball at the nasal side, and the optic nerve is forced to pass into the opening in the spoon. The eyeball is then brought forward as far as possible and a pair of strong curved scissors are passed into the socket underneath the spoon at the nasal side, and the optic nerve is cut off as far back as possible. The eyeball is then drawn forward, the oblique muscles and connective tissue are severed, and the operation is finished.

It is always well in cases of injury to thrust the finger into the socket and carefully feel all portions of this cavity, in order to remove any foreign body that might be present. Some operators draw the conjunctiva together with sutures, others do not. Troublesome hemorrhage is extremely rare.

This operation is indicated under certain conditions; first, if for any reason it is necessary to perform as quick an operation as possible; for instance, in extreme old age, or where an anesthetic is considered particularly dangerous, or secondly, where pus has found its way into the orbital cavity and it is deemed unwise to close up the opening for fear of pus detention and its consequences, or thirdly, where it is proposed to thoroughly remove the socket contents as is the case in malignant growth, etc. The objection to this operation is the ghastly deformity which is produced. No effort being made to hold orbital tissue together it, of course, sinks back to the orbital walls and a great hollow cavity is produced. It allows a sinking of the eyelids that cannot be held out in position even when an artificial shell is worn. Besides this, the ocular muscles being put out of use entirely, the contents of the socket have no motion, so that when an artificial eye is inserted it is simply a motionless shell, set into a deep concavity. The eyeball, therefore, has a lifeless, staring, motionless appearance, and never looks in the least natural, there being no particular cushion upon which the artificial shell may rest, but, of course, sinks back into the socket, which still further emphasizes the deformity.

Owing to the necessarily unsightly result of this operation I never perform it except under the conditions enumerated, and very much prefer another operation which is a distinct modification and improvement over the procedure just described. The operation is like the Bonnett operation until it comes to severing the tendons of the recti muscles. Instead of merely severing the tendons and letting them fly back into the socket before the tendon is severed, each tendon is picked up by a strabismus hoop in order to find it, and then one blade of a Prince's strabismus forceps is passed underneath the tendon and made to take the place of the strabismus hook, which is now withdrawn. Some of the overlying conjunctival tissue is then pulled forward with a pair of forceps and the two blades of the Prince's strabismus forceps are then closed and locked, so that they contain within their blades not only the tendon, but the overlying conjunctiva. The tendon is then severed from the eyeball, between the eyeball and the forceps, as close to the sclera as possible, and a curved needle loaded with chromicized catgut, is then passed through the conjunctiva and tendon, and then again backwards through the tendon and conjunctiva, quilting it, as it were, after which the forceps are removed. This same procedure is gone through with in the case of the other recti muscles, using the same needle and thread, passing from one tendon to the other until all have become included in the single catgut suture, which now becomes a suture of the purse-string variety.

In this operation and the one previously described, I believe it is wise to always commence procedures upon the superior rectus muscle, as this muscle is up under the upper lid and is easier to get at than the other muscles which are, as yet, unsevered and exert a traction upon the eyeball. I usually first cut and quilt the superior rectus muscle, then the external, then the inferior, and then the internal. The

speculum is now depressed and the eyeball made to pop out of the socket. The spoon is introduced between the sclera and the surrounding tissue, and made to engage the optic nerve in its slot. The optic nerve is severed with the curved scissors, the oblique muscles and connective tissue are cut, and the eyeball is removed.

Great care should be taken in the insertion of the strong scissors for the purpose of severing the optic nerve, that they do not at the same time cut the catgut suture, as this would, of course, completely defeat the object of the procedure. The two ends of the suture are therefore held away from the eyeball by an assistant in order that they may be kept in view and not cut. The two ends of the suture are now brought together and tied. It will be seen that this suture now contains the four recti muscles and the orbital conjunctiva which, when all are healed together, produces a prominent and movable stump. The socket is not now a great hollow cavity as is the case in the Bonnett operation and the lids do not sink inwards to any great extent, even in the absence of an artificial shell. There is much less orbital discharge and what there is, is more easily drained away. The tears also are much more readily drained into the proper channels, and when an artificial shell is worn there is not the constant appearance of undrained tears and secretions which dry upon the artificial shell and give it a particularly foul and disagreeable appearance. The wall of muscles, conjunctiva, etc., which we have produced, holds the artificial shell well forward, and as the stump is freely movable, the shell also moves freely, and the deformity is reduced almost to a minimum. All things considered, I regard this operation the best for the removal of an eyeball. It is far superior to the Bonnett operation and is almost as good in its cosmetic results as the Mule's operation, and does not possess any of its difficulties and annoyances.

It often happens that we are compelled to remove eyeballs that have become ruptured through injury, ulceration, etc. These eyeballs are collapsed and the moment any pressure is exerted upon them an escape of vitreous humor is produced so that they are much more difficult from a surgical standpoint, than the unruptured eyeball which maintains its shape and form during any operative procedure. In cases of this kind I always pass a strong suture through both lips of the ruptured opening and tie them together with a firm knot possessing long ends. This prevents any further escape of vitreous, and I frequently, before tying the suture, fill the eyeball with water, which considerably restores the collapsed eyeball to its ordinary fullness and facilitates the subsequent steps of the operation. The strong suture which I advise, can be held by an assistant and the eyeball can be pulled by him in any direction desired by the operator, which very materially facilitates the subsequent steps of the operation.

The operation of evisceration of the eyeball was devised for the purpose of producing a prominent, movable stump, filling in the orbital cavity and producing a good stump for the artificial shell. It consists essentially in the amputation of the front part of the eye and the removal of the contents of the eyeball. This leaves the sclera and eye muscles untouched. The operation is performed as follows:

After the eye is cleaned and the speculum inserted, a knife is inserted at the temporal side of the eyeball, just behind the iris, and thrust completely through the eyeball, so that the globe is transfixed on the blade. The blade is then forced through the intervening tissue so that a complete opening of the eyeball is made, involving about one-half of its structure. The partially abscised flap involving principally corneal tissue is then grasped with a pair of forceps and the remaining half of the anterior portion of the eyeball is removed with scissors. This opens up the entire interior of the globe. The contents of the scleral shell should now be thoroughly removed with curette and the interior mopped out with gauze pledgets, and perhaps cauterized with carbolic acid, the effect of which should be neutralized with alcohol. Some operators close the opening with sutures, others leave the opening unsutured and allow it to heal of itself. Some cases of sym-

pathetic ophthalmia have been reported following this operation, depriving it of a certain measure of popularity, and I do not think it is now often used. Personally, I do not use it at all, as I prefer the operation just previously described, as I believe it is much safer and produces just as good cosmetic results as the operation for evisceration.

The operation I shall next describe is known as the Mules' operation, because devised by Dr. Mules of England. It undoubtedly yields the best cosmetic results of any operation in existence; in fact, the cosmetic affect is almost perfect, and if the Mules' operation is properly performed and a suitable eye inserted, the appearance, movement, etc., are so natural as to in many instances defy detection. I think, however, this is an operation which should be performed only under certain conditions, where cosmetic results are of the utmost importance. For instance, I would be disposed to make an operation of this nature in the case of a woman, especially a young and comely woman, whose physical appearance is of great importance. I would also be inclined to make this operation in the case of a young business man who has his way to make in the world, and whose progress might be materially hampered by an unsightly physical appearance. I think it would be unwise and foolish to make an operation of this kind upon a laboring man or a washerwoman, or any person engaged in similar avocations, as their physical appearance is not of such great importance and there are other operations which are more practical and more suitable to their circumstances and conditions in life. The operation is performed as follows:

The first steps of the operation are exactly like those of the ordinary evisceration just described, but when it comes to removing the contents of the globe it should be done with extra care and detail. The interior of the scleral sac should be curetted and mopped until every vestige of choroid, etc., are removed. I think it is well to mop out the interior of the sac with carbolic acid, afterwards neutralized with alcohol. After this has been accomplished a Mules' globe is inserted within the scleral sac. A Mules' globe consists of a hollow sphere of glass. These are made in various sizes and the globe should always be small enough so that it can be easily inserted inside of the sclera and will not be a tight fit when the sclera is closed over it with sutures. The globe should, of course, be thoroughly sterilized. After a globe of proper size has been duly inserted within the scleral sac, the edges of the scleral opening should be brought together with fine black silk sutures. These sutures should be placed close together so as to completely close the opening and to make a firm line of union. The principal difficulty of this operation has been that after a greater or less length of time the closed scleral opening may reopen on account of a suture or two giving way, producing a gap which gradually enlarges and eventually allows expulsion of the glass globe. The principal way of guarding against this is to insert sufficient sutures to produce an unbreakable union. After the scleral opening has been firmly sutured the conjunctiva should be brought together by enough fine sutures to produce a thorough union. It is usually advisable to place this line of sutures at right angles to the scleral sutures. The scleral sutures should be cut off as short as possible, because they are to remain permanently. The conjunctival sutures may be removed in six or seven days. This operation produces a prominent movable stump, the muscles not being disturbed in any way. There is no sinking of the eyelids, even when the shell is removed, and when a properly adjusted shell is inserted the appearance is absolutely lifelike. Several substitutes for the glass globes have been suggested, such as aluminum, gold, paraffin, etc., but in my opinion the glass globe is better than any of them. The only objection to the glass globe is that it is supposed to be breakable. A glass globe if properly made is very strong and could easily stand a hard blow, especially when the soft orbital tissues are taken into consideration. Personally, I have never heard of a glass globe being broken inside of the soket.

In conclusion I would say that all four of these operations are good and permissible operations. In my practice I have eliminated entirely the evisceration operation. I use the

original Bonnett operation where a short anesthetic is desirable, in aged people, and where the personal appearance is of no consideration, or where I am afraid of orbital or malignant infections or growths. The operation I use in a vast majority of my cases is the modification of the Bonnett operation, where I make a complete enucleation, but preserve the functions of the muscles and conjunctiva. Where personal appearance is of extreme importance I make use of the Mules' operation.

72 Madison St.

DISCUSSION.

Dr. F. C. Vandervort, Bloomington, Ill.: It seems to me that any one hearing the explicit details for doing these operations, could perform them. While I do not believe that the average railway surgeon is very often called upon to do this work; I desire to assure the essayist of my appreciation of the paper. I am a little surprised, however, that he has put upon us the statement that "when an eye is no longer *sightly,* it is better to remove it."

Dr. J. L. Wiggins, East St. Louis, Ill.: I desire to compliment Dr. Allport on the very simple manner in which he has presented this paper, a manner by which it can be easily understood by all, and he has successfully escaped the tiresomeness that frequently accompanies the presentation of papers on this subject. I have never, I believe, heard an operation described so clearly and beautifully in all its details. So far as discussion upon it is concerned, it is past the point of discussion. It is a clear presentation of an operation that should be understood, and, if necessity arise, followed by every surgeon who endeavors to do any eye work.

Dr. D. T. Martin, Pomeroy, Iowa: I have listened on other occasions to the reading of papers by Dr. Allport, and, referring to what the last speaker just said, they are always of that character. He presents the subject so clearly and concisely that all of us can understand. The ordinary surgeon sometimes has occasion to enucleate eyes. I, who practice in a country village, have had several such occasions. In the matter of securing a better cosmetic effect, Dr. Allport has opened up the way very completely and has described the technic in such a manner that those of us who have had even a limited experience in enucleating eyes could undoubtedly secure a better cosmetic effect, which is in many cases very desirable. I had hoped that Dr. Allport would give us a little more on the treatment of trauma. We so often meet and have to care for cases of injury of the eye, and sometimes the country surgeon is somewhat at a loss, removed as he is from specialists, to know just what method to pursue. Therefore I was, as stated, in hopes that the Doctor would give us something along this line.

Dr. D. G. Murrell, Paducah, Ky.: There is one point in this paper upon which I would like information: In those cases in which a glass ball is inserted in the socket, what does Dr. Allport do as to curetting? How many of them act as a foreign body? Are the majority of them made without the ball being expelled?

Dr. Allport (closing): In regard to Dr. Murrell's question, I will say that I think the vast majority of these globes remain where they are placed. If they are properly inserted, if the scleral sac is clean and thoroughly aseptic, and if the globe is small enough and retained with a sufficient number of well anchored sutures, I see no reason why the ball should be expelled. I have done in the neighborhood of perhaps fifty Mules' operations and have never lost but one globe. It is not a complicated operation and there is no reason why a surgeon of Dr. Murrell's experience should hesitate to perform it.

Dr. Vandervort has said that railway surgeons do not often perform eyeball enucleations. I must beg leave to differ with this gentleman; at least, I desire to venture the opinion that there is no reason why railway surgeons should not perform such operations. It is not necessary to send such cases to an oculist unless so desired. There is no reason why any experienced surgeon in this room should hesitate to remove an eye, and I feel confident that if the detailed steps of the various operations are carried out as I have endeavored to describe them in this paper, no surgeon of experience will have any difficulty in accomplishing good work.

I thank the gentlemen very much indeed for the kindness with which my paper has been received.

"A DEMONSTRATION OF THE MAXWELL-RUTH METHOD OF TREATING FRACTURES OF THE NECK OF THE FEMUR."*

C. E. RUTH, M. D., DENVER, COL.

The subject of fractures of the neck of the femur has had for me more than ordinary interest for many years because in the first place there has been such a text-book unanimity in reference to the unsatisfactory results of all methods of treatment, and 100 years ago it was denied by almost all surgeons that bony union was possible after a fracture of the neck of the femur. Then it was granted by a few as a possibility and viewed as a sort of rarity and curiosity.

Some 16.6 per cent of fractures are of the neck of the femur—33 per cent of all fractures after the age of 70 are of the neck of the femur, and nearly every community has one or more specimens of very bad results of this fracture with loss of the use of limb at a time in life when from an intellectual standpoint, at least, the individual was at his zenith though physically perhaps on the decline, and is lost essentially to the community from that date forward.

Nineteen years ago I heard Dr. T. J. Maxwell take up this subject and I was impressed with the fact that he had the right idea, and also with this other fact that muscular action has more to do with nonunion or the securing of fibrous union as the result of fractures of the neck of the femur than fracture in any other part of the body, because a greater number of powerful muscles pass across the fracture line and produce and maintain displacement of the fragments. We have to add to that of course, when the individual is in the recumbent posture the displacing influence of weight, and then we must add another factor that is lost sight of in all the text-books on surgery and also anatomy, and that is the change or the conversion of muscle power in its action from one direction to another. I speak with reference to the psoas and iliacus.

Now it was early learned that something could be accomplished by extension, the so-called longitudinal or Buck's extension, and the legs could be brought to a corresponding length. After fracture had occurred, with the usual unmistakable symptoms of fracture, which we may epitomize by saying that there is shortening, if there is no impaction there is nearly always complete eversion. The trochanter is above the Nélaton line; there is in some of the cases crepitus and we will have occasion to mention other points, but especially the fact that after fracture of the neck of the femur in rotating the shaft of the femur there is no longer a tendency for the trochanter to describe the segment of a circle whose radius is represented by the length of the normal neck of the femur.

Now in considering this subject we do not care to attempt to discriminate between intra and extra-capsular fracture, or fractures partly within and partly without the capsule. Those who understand their anatomy know that wholly extra-capsular fracture of the neck of the femur is an anatomic impossibility. So far as the rsults are concerned, so far as the proper adjustment or retention of the fragments is concerned in their proper position it does not matter whether—in other words, in applying the proper treatment—whether you have an intra or an extra or so-called fracture of the neck of the femur.

We have been utilizing in our efforts to secure adjustment of the fragments the ordinary Buck's extension, with the addition of the long splint or the Thomas splint or the Hodgen splint; we have been overcoming the action of those muscles acting vertically, which are the vertical part of the adductor magnus; we may say also the rectus, tensor vaginæ femoris, gracilis, sartorius, biceps, the semi- tendinosus and semi-membranosus. These all act essentially vertically. Now we take the entire adductor group with the pectineus and we find that their

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action is diagonal or oblique. (We may add also to that all of the gluteal group.) Then we take the pyriformis, gemellus superior and inferior, obturator externus and internus, and the quadratus femoris, their pull is directly inward. Now it stands to reason at once that a purely longitudinal extension deals only with the muscles acting longitudinally, and has nothing to do with the oblique and transverse pull so far as their displacement is concerned out of the vertical. So we come to the last muscle or pair of muscles that I want to consider just for an instant and we are through with that part. Now I have some artificial muscles here placed, as you see, the psoas and iliacus. Of course, I cannot make their point of insertion normal, but so far as the point of origin of the psoas is concerned I have to stop it at the brim of the pelvis. Now you will note the fact that as these muscles pass the neck of the femur they are directly in contact with it.

I want to call attention to another thing. Your anatomies formerly—most of you are men in middle life or past— your anatomies all told you that these muscles were external rotators. Is that true? The head of the femur is internal to the line of action of these muscles. Now then I want to show you that they are internal rotators always (illustrating), as you can easily see. I will just let it go and you see it turn up in internal rotation against the finger. If we had less friction it would do it more promptly. Now they are always internal rotators provided the leg be in normal extension. Now then do not forget that when the leg is extended the muscle is directly in contact with and presses upon the capsule of the hip joint. I want to show you that as soon as the neck of the femur is broken that these muscles become powerful external rotators. We pull this down in position. Now I will let go of this and see what results. It immediately rotates the femur outward. Why? Because the point of resistance is changed, if there is any resistance at all it is at the top of the trochanter and is external to the line of action of the muscles.

Another point that is worthy of your thought is that it will tend by its action to force soft parts between the fragments. I do not want you to lose sight of that. Of course, simple extension does not overcome the tendency to eversion that these muscles produce. Barring the primary injury with its tendency to produce displacement we feel that we have a right to say that muscular action is the most potent factor in giving the bad results that we have had.

Dr. Maxwell's first case that he treated by this method essentially came into his hands 37 or 38 years ago. He put on Buck's extension and brought the injured foot down so the legs were of the same length. The woman still complained of pain. There was flattening of the hip and the trochanter rested behind its normal position as compared with the opposite side. If he placed his hand under the thigh, raised and pulled the upper end of the distal fragment outward he brought the trochanter on the injured side so it was as prominent as the one on the other side. The woman was at once relieved of her discomfort. There was no longer any flattening or deformity and he concluded that if he could put on traction so the displacement influence of these muscles which pulled internally and obliquely would be overcome as thoroughly as those that acted vertically then the woman would be continually comfortable and the fragments would have a chance to unite.

I will show you by a wet specimen and a fresh one, if you care to see it later, that if we will make traction in line with the neck of the femur that we will cause the capsule of the hip joint which is not perfectly, but usually fairly intact, to act as a close fitting sleeve to adjust and align and maintain the normal position of these fragments provided the traction is made constant. Now, then, how is it possible to make traction here so that it will overcome the action of all of these muscles? It is very evident we cannot make a traction here that will be in line with the neck of the femur exactly unless we get a resultant of more than one force, so we will make our longitudinal traction by Buck's extension; then we will make another traction upward and outward, and here come up ques-

tions of how much pull here and how much pull there. To get what? To get a resultant whose traction force is in line with the neck of the femur. That is what we want. We do not want to pull it directly downward nor directly outward this way, but combining these forces so the resultant will be in line with the femural neck. (Illustrating.) Now, then, we think we have that.

I have from my own experience, Dr. Maxwell's and the great number that have been reported to me, from other sources, been able to collect over 50 cases that I have published treated by this method. I have verbal reports of more than 50 besides, which would make over 100. I have had verbal reports of 3 or 4 since I came in here from men who are members of this Society who have treated cases that I knew nothing about, who are working quietly and getting their results, so that we have had, all told, at least 100 cases that I know of in which the results tally with those that Dr. Maxwell and I have had in which I have published the reports.

Now Dr. Maxwell worked on this for 20 years before he was able to get any bone specimens. Since then we have been able to collect a few, and I will pass these specimens around so you can see them. Each one has a tag on and I believe a number as they were published from which the complete record may be obtained. This is the first specimen secured. The patient was the second one treated by Dr. Maxwell. You can notice on this piece the line of solution of continuity, but the trouble was this was a little too good to be believed by all men as true. It was declared when first presented, and Dr. Grant here was of that opinion, that it had not been broken, and he so expressed himself. Fortunately a year after I was able to have 2 more bone specimens, so we have gone on collecting them. This man had 2 inches of shortening, complete eversion, flattening of the hip and crepitus, and, as I said, the man was 72 when it happened and he lived 20 years after, dying at the age of 92. You can tell by the tuberosities for muscular attachment that he was a very powerful man.

This (2) is, a specimen which I value very highly because this man went a week without any treatment, was 70, and was suffering from softening of the brain when the injury occurred. He was treated by Dr. Maxwell for four weeks and suddenly died of a cerebral malady. If you will examine the specimen closely you will see the line of union, which of course, would not be very strong, but had this man lived a year no one could have told that a fracture had occurred of this bone any more than the other one.

When I was charged with getting the wrong bone, because the result was too good, I commenced collecting them in pairs—so we could make a real showdown on the case, and here I have the first pair that I was able to get in that way. This woman (3), was 70 when the fracture occurred and was suffering from advanced lupus. She had gone a week or ten days, I forget now which, without any treatment, lying in a hovel in filth, and you note the result. It speaks for itself. We have some shortening, you see, of the neck of the femur, more marked posteriorly. This patient I had before the class a number of times, for she lived about 3 years afterward, and the class were unable to tell which limb was broken, but the slight eversion testified to the condition through her life. There was no impairment of functions in the first or this case, and I want to say that in these first three specimens passed there was no demonstrable shortening.

This (4) is a specimen from a patient treated by myself who was 70 when the fracture occurred and she lived 8 years afterward. When I was back at Keokuk in October, my old assistant, Dr. Armentrout, presented these specimens to me. I had a contract for the securing of this pair of bones when the old lady was through with them and I had turned the contract over to the Doctor when I left in June and he saw a newspaper report of the necessity for prompt action and he got these specimens. You can see in this case there was about ½ inch of shortening. This also was a very serviceable limb.

This woman (5), was a case treated by Dr. Colter and Dr. Walker, and I think Dr. Maxwell saw the case also. This woman was 78 when the fracture occurred and she lived 8

years after, and did the work of an ordinary farmer's wife and part of the time cooked for 11 people. So far as strength and use of the limb were concerned there was no impairment.

I had another specimen (6) which the Doctor loaned to me for awhile and then wanted it back again, but I will pass these reprints and you can see them on page 11. This man was 81 when the fracture occurred and recovered without any impairment of functions, but had a little shortening. He was overcome by sunstroke while in his orchard at work the following summer, or 8 months after the injury.

This specimen (7), is rather a sorry-looking affair and is No. 52 in the published report. This patient I treated myself so I take the blame of whatever unsatisfactory result there is in it, but I never felt I was quite as skilled as Dr. Maxwell in the management of these cases. But I have a little apology to hake in reference to this. This woman was a cripple, the other leg not having been used for 8 years, the knee being flexed nearly at a right angle, so I had no standard to measure by. You will note also that the great and lesser trochanters are split off down their shaft for a distance of 4 inches, the fracture of the neck being complete at the base. Now this patient took malarial fever 6 weeks after the injury and I do not suppose any repair of the fracture took place after that. We had union by that time and dismissed the matter so far as necessity for further treatment of the fracture was concerned.

Question: How about the comfort of the patients?

Dr. Ruth: We will get to that in a little while. I believe Dr. Grant can help us out on that.

Now for the details of the matter: You will notice here we have an extension apparatus on this young man (exhibiting patient in bed with apparatus attached), to illustrate the details of the work. There have been probably all told half a dozen of these patients who complained quite a little of pain, none of severe pain. Nearly every patient was entirely comfortable within 24 hours after the proper adjustment of the apparatus. By "proper adjustment" I mean, first, the placing of the Buck's extension so that it shall be sufficiently extensive in its bearing and non-irritating in quality, the Z. O. plaster I believe being more satisfactory than any other, and I extend it from the ankle up to or past the middle of the thigh, 2 or 3 inches in width, sometimes divide it above the knee and extend a branch forward and backward. I encircle the leg above the ankle with a strip of the plaster and also a strip around just above the knee, and then at the top. This is for the purpose of getting the maximum amount of surface on which traction shall be made so as to minimize the amount of irritation on the integument so that it will hold and stand all the traction required for all the time necessary without change, and this usually is the case. Once in a while it is necessary to change it. Dr. Maxwell at first used all his extension below the knee, but later used it all above the knee, because he found that in some cases he had ankylosis of the knee from the long extension without motion, but I want to say that that long extension without motion is entirely unnecessary.

While the traction is on, there is never any objection to raising the knee (illustrating with patient), to any desired height, and thereby bending the knee sufficiently, because you do not in any sense disturb the fragments. I have been criticised for making this statement. All of these patients were raised to the sitting posture every day, and sometimes twice or three times a day, especially if they are very old and feeble so hypostatic congestion from dorsal decubitus will not occur, which would be a serious matter, and they must be brought to a sitting posture and that frequently, and then the back can be rubbed, washed and massaged and they can be cleansed perfectly without disturbing these fragments, I have said, a particle. I believe that to be absolutely true because if you have your traction sufficient in both these directions to entirely overcome the muscular action, tire them out, put the muscles at rest, then you have your traction in line with the neck of the femur,

you have your pull on the capsule and not on muscle. Now if you have those conditions obtaining in the case, the muscles at rest, keep in mind the fact that the proximal fragment is absolutely passive. There is no muscle attached to the proximal fragment so the position of the proximal fragment depends entirely upon the traction that you have and the adjustment that you have made by your traction as we have mentioned. I said I was criticised for this statement. My opinion is based on the ability of the patients to walk with slight impairment or no impairment of function, with moderate and even in some cases no shortening, and the testimony of these bone specimens that we have passed about.

In one case I know of, the patient sat up during the entire day, as much as he liked, and that was nearly all the time after the second week, and the result was just as good as in any of the others. All these patients are raised to a sitting posture every day, all of the patients except the old lady who was crippled in the other leg and who could not help herself—the sound leg is flexed in this manner upon the thigh and the thigh upon the abdomen and the patient by the use of the sound leg raises the hips so a bed pan can be slipped under, and still it does not interfere at all with repair. The essentials, of course, for repair of a fracture are immobilization of the fragments and that, if you have satisfactory adjustment of your weights, will certainly be obtained. It stands to reason that you must have the injured leg supported by a small pillow extending from the heel up to or above the knee, so the heel does not bear weight. Your spreader must be of sufficient weight so the malleoli are not pressed upon.

The foot of the bed must be raised how much? Sufficiently so that the patient does not tend to work toward the foot of the bed, simply so that you use the body for your counter traction, that is all. How much shall you tilt the side of the bed? Just so that your patient tends neither to work to the opposite side nor toward your pulley, so that you may maintain your angle of traction here right. I spoke a few moments ago of the tendency to eversion of the foot and the tendency also of the upper end of the lower fragment to drop behind the proximal fragment. Now it is necessary for us to make this traction sufficiently upward as well as outward so that we will be able to raise the upper end of the distal fragment to the proper height and overcome the tendency to eversion so that usually we use no sand bag, no sand bag ought ever to be extended up the leg. Sometimes we use a sand bag to support the toes a little at the outer side and another one at the heel so the foot is fixed a little by sand bags. The best control of the tendency to eversion is obtained by securing the binder's board molded to the upper inner side of the thigh by adhesive straps so it cannot be displaced by rotation, and then the adhesive plaster passing around the thigh and up to the lateral pulley can have greater or less pull on its upper or lower side so as to perfectly control the eversion without any sand bag or other appliance.

Another point—we take a piece of binder's board about 6 inches in width and long enough to reach two-thirds of the way around the upper end of the thigh. This is molded to the posterior aspect and inner side of the thigh. An adhesive plaster is passed around the upper part of that, because if you make your traction with an ordinary fold of towel or bandage it will fold up into a small space and will cut into the thigh like a string; but if you distribute the weight or the pull evenly over the surface it causes no pain or discomfort. And then it is a good idea also to cover the inner side of your binder's board with cotton so the margins not only are trimmed off first, but the cotton so placed as to prevent any excoriation in that way; in that way they will stand all the pull that is required.

Now you ask at once how much of a pull will you want in a longitudinal direction and how much will you want in the lateral direction to meet these conditions. I shall have to answer that in this way, you must simply put on your weights to do the work. There are no hard and fast rules with reference to the amount of weight. For a man probably of

my muscularity and size the longitudinal pull would need to be 25 pounds; an old feeble woman might not require more than 7 to 10. The lateral pull usually is about two-thirds the longitudinal pull. It would require about two-thirds of the lateral pull, in my case say 15 pounds of lateral traction. That would bring the hip to the proper level and proper prominence. When I mention the fact, however, that some of these patients are old women with buttocks that would do justice to a "Hottentot Venus," with very little muscularity, you can see we must have a heavy upward pull to overcome the weight. The upward pull is of more importance sometimes in these cases than the lateral pull, so that we have to use this with a grain of sense.

What is the range of applicability of the treatment? I know of no age or physical condition in which it is not applicable. I know of no "let alone" or any other line of treatment which gives anything like the degree of comfort to the patient that this does. That is the testimony also of Dr. Ochsner of Chicago, and Dr. Moore of Minneapolis, the former of whom has used the method very extensively.

Now a word with reference to a treatment which has been advocated and practiced a good deal of late years, of which Dr. Senn is the author, and yet he closes his report of 8 cases with this statement, that it is not applicable to all cases. You know the treatment—with the patient standing, and some of these are in very poor shape for it, a cast is put on, the longitudinal extension is secured by the weight of the limb while the patient stands on the sound limb. Now all recognize this fact that in the obese the cast is loose in less than 48 hours. It gets looser and looser very rapidly. Just when you want fixation you fail to secure it. Then you are familiar also with the ratchet screw principle he incorporates in the plaster to be jacked up every little while. If this plan of treatment is correct, Dr. Senn is wrong because it is diametrically opposed to it.

I have been criticised somewhat for making a statement in an article on this subject that was published in the *Therapeutic Gazette* last March in which I stated that professional incompetency is the reason for the bad results that we have been having in treating fractures of the femoral neck. Now I felt I had a right to make that. That is one reason I made it, because I believed it true. I believe it still. The other reason was that Dr. Maxwell and myself for a good many years have been trying to impress the profession with the importance of this method, that we had evidence enough to convince us was right in principle and would give satisfactory results and so I wanted to attract enough attention so they would read it at least.

To illustrate a little further the principle that I mentioned, but did not illustrate to you, of the action of the capsular ligament, I have here a wet specimen in which I have sectioned the neck of the femur twice. You see the capsular ligament is half cut away, half of it is gone and I have produced all the displacement of those fragments that I can, that is, all I can get out of it without tearing the pieces out. Now, then, I will make traction in the normal line with the remnant of this capsule and I want you to note the results. I will make the pull as strong as I can and then I will turn it up so you can see it. You see the perfect adjustment. Now you can easily see if I keep up that pull in line with the normal direction of the neck of the femur, in other words, if I keep that capsular ligament taut, and I have only half a capsule, I have alignment, I have adjustment of the fragments. I think that that is conclusive with reference to the retentive powers of the capsule when kept taut in proper direction.

To illustrate further I will now displace the fragments as far as I can. I have rotated the head of the femur out of position and have drawn this piece down as far as it will go without tearing it entirely loose. Now I will simply make traction in line with the neck of the femur, and you see it lines up as I make my traction in line with the neck of the femur. Do you see I have got perfect adjustment and I have only half a capsule, that is the interesting point. You have a good deal more than half a capsule in the majority of cases. You

have usually a very small tear in the capsule unless by violence in the manipulation the capsule, in attempts at reducing a supposed dislocation, is sometimes badly torn to pieces, and a serious complication is produced thereby.

Another point in reference to the reduction of the displacement: I spoke to you of the action of the psoas and iliacus, that they pull directly across the fracture line; that when the fracture occurs they tend to force soft parts between the fragments. Now it is essential that we eliminate this as an important factor in the case and how shall we do it. I think I can illustrate it with these bones and artificial muscles so it will be plain to you. Now note this: If I bring the thigh to a right angle with the trunk, what happens? The muscles are out of the way. They are clear up above the fracture line, acting above it, they are not making any push at all of soft parts between the fragments. Now, then, that simply gives us a hint in the proper method of reducing the displacement. Flex the thigh at right angle to the trunk and while you make traction in that position an assistant pulls outward on the upper end of the lower fragment and then when your extension is made nothing is forced between the fragment because they are all approximated by the sleeve-like action of the capsular ligament.

Another essential is how long shall we leave this traction on and what shall be the continued weight applied, that is, shall we leave the same force of traction on all the time? I believe if any patient under this treatment lives, as I have stated in this article I spoke of, 4 or 5 weeks you will get union without any question, because I have known of no case in which that was not the result, so I feel that I have a right to make that statement—4 or 5 weeks will give union in any case, I believe, that has vitality enough to live that length of time. Then after a week you do not need the amount of weight required at first. Why? Because those muscles have given up the fight, there is no longer any spasmodic action of the muscles tending to carry the upper end of the distal fragment over the fracture line to produce irritation, so you begin to reduce the weight. The best way I know of to apply the weight is with a bucket with sand in it—you put a little sand in or take a little out as you need to meet the conditions. By the end of the third week you have not more than about one-half to a third of the weight you started with, and by the fourth or fifth week, you have simply got enough there to restrain the patient a little, that is all.

DISCUSSION.

Dr. L. Reynolds, Horton, Kas.: I would like to know of Dr. Ruth what per cent of these fractures are impacted and whether he regards this treatment as at all necessary in the impacted cases.

Dr. W. W. Grant, Denver, Col.: I would like to ask for the specimen of the case, figure 9, the case reported and the one I once before criticised. This is the specimen, Gentlemen, that I expressed the opinion had never been fractured. Unfortunately, Dr. Ruth in this case did not secure the neck or head of the other femur. I maintain that the probabilities are that the other neck would present very much as perfect an appearance as this and no more so, and that without any pathologic indication of a fracture—in a patient of 72 that there *should* be some shortening and some change of angle. I expressed this opinion before the Surgical Section of the American Medical Association at St. Paul. I still doubt extremely, Gentlemen, whether that neck was ever fractured.

Now there are 2 other specimens which I have examined here that are extremely interesting. They are manifestly impacted fractures, the fracture of the base of the neck driven into the trochanter major. I maintain that these cases do not fully illustrate Dr. Ruth's contention and are hardly just to his treatment. Those specimens would get well by bony union by any method if you did not use too much violence and force in attempting to reduce them. In fact, any quiet treatment will produce a bony union in those cases. I criticised Dr. Ruth's treatment once in this way, that in the reports of the cases he did not discriminate between the purely intra-capsular fracture and a fracture partly within the cap-

sule and partly without. By the old treatment, certainly in a large proportion of cases of fracture partly without the capsule, bony union resulted without the modification which Dr. Maxwell has instituted and which I am ready to endorse.

But it is a question as to the kind of cases in which it is useful. I maintain, therefore, that violent extension in either direction in the impacted fractures is a manifest mistake. If you dislodge these impactions you give the patient more trouble and you make it more difficult to secure thorough bony union. Dr. Ruth admits that he did not try in many of these cases to make that accurate diagnosis as to whether the fractures were purely within, in other words those at the small part of the neck where the fracture is usually transverse, and those which are partly without and partly within, but regardless of the exact location he treated them in this way with the results which have been stated. Now the intra-capsular fracture pure and simple at the small part of the neck is attended immediately with hardly any shortening. In the case of which I speak—and of which this is the specimen—Dr. Maxwell stated there was 2 or 3 inches shortening immediately with remarkable crepitus. I could hardly reconcile that with this specimen, and when asked how I could explain that shortening I stated, that a fracture of the acetabular rim with a dislocation would very readily explain it and the treatment adopted would very readily reduce it and he would get such a result as we have.

Now I want to state that I have had a little experience in these treatments since the St. Paul meeting, and that experience is favorable to the method. I am never so strongly convinced of anything that I am not willing—and it don't make any difference in what department or line it is—to change my opinion if facts justify it. I have shown Dr. Plummer within a year a Rock Island case in a woman of 54 in St. Luke's hospital which I treated by this method, I raised the foot of the bed a little more than Dr. Ruth has here—

Dr. Ruth: This is not placed exactly right as we ran out of material. The foot should be raised higher.

Dr. Grant: Yes, and the side on which the fracture is raised about 4 inches. I did not believe the patient would be very comfortable in that position and under such treatment. I was intensely gratified to find that this old lady said she was very comfortable, she did not complain of any pain, but the greatest difficulty I had was to keep her from pulling a pillow or something, if she could get it, under her head on the lower side to sort of counterbalance her, but notwithstanding that she was throughout the treatment exceedingly comfortable. I believed, having given that patient an anesthetic and having made a very careful examination, with hardly any shortening at the time, but finding distinct crepitus, that that was a case of pure intra-capsular fracture of the femur, and I think so still. I got a most excellent result in that case, bony union within 5 or 6 weeks at least of treatment, not a single bed sore and no complaint other than such as patients would make with regard to any method of treatment used. As to the specimens I think Dr. Ruth rather overdoes it in some measure, in his enthusiasm, in attempting to make these impacted fractures a justification of this method of treatment as superior to all others.

Dr. Ruth: None were impacted.

Dr. Grant: I believe there are 2 specimens here which were impacted, Doctor, if the eyes tell anything, and I would like to show them. I pointed them out to some surgeons present and you can even measure, I believe, the depth of the impaction.

Dr. Ruth: Pass them over, please. This (indicating), is my own treatment. This is mine, too.

Dr. Grant: Now, Gentlemen, this is an impacted fracture, but there is another one showing it even plainer than this, with the neck driven into the trochanter and in one the trochanter itself shows the impaction. Now that I regard as an impacted fracture with a twist—distinct fracture on that side, but this side looking more like a bend. There is another specimen here: I regard this as an impaction also. The measure of shortening is exactly the measure of the impaction, and in such a case you might dislodge this by violent

extension. I think Dr. Ruth does not use as extreme extension as has been customary in some of these cases.

Question by a Member: How would you differentiate between an impaction and a true fracture?

Dr. Grant: In an impaction you would have no crepitus or unusual mobility unless you dislodged it; you would have some distinct shortening, and that shortening would be the measure of the impaction and no more.

Question by a Member: If it was over ½ inch shortening would it be an impacted fracture?

Dr. Grant: I should think it might be in a large bone. If you measure the depth of the shaft of the femur here, it is very easy to have ½-inch impaction in trochanter and not break the outer shell of the bone.

But I want to endorse the treatment as applicable to a large number of these cases. I do not think the extension treatment, if much weight is used, to be at all appropriate for an impacted fracture.

Dr. Ruth: I never advocated it.

Dr. Grant: I know you didn't. It is just a question as to whether you regard this as impaction. I regard one of these as decidedly a case of impaction.

Dr. H. A. Leipziger, Burlington, Iowa: To those who are not so familiar with the subject as the essayist and Dr. Grant one question might arise that is not easily solved. If, as Dr. Grant states, this method of treatment is not applicable to impacted fractures and yet this bone represents an impacted fracture and gives a history of such an excellent result with this treatment how can we reconcile the fact that it is not applicable to impacted fractures?

Dr. Grant: That I maintain was never fractured at all. (Laughter.)

Dr. Leipziger: I think the Doctor spoke of other cases, of specimens, which were impacted or looked like impacted fractures. I left at home an old lady on a bed put up like that, and I do not know whether she had an impacted fracture or not or whether she had an extra-capsular fracture or an intra-capsular fracture—I do not think that one out of fifty of us here would be able to differentiate or tell the difference—but I do know this, that for 3 or 4 days after her injury the old lady was only kept free from pain in a tolerable degree by hypodermics of heroin and morphin; that after the application of this apparatus the old lady required no anodyne. That she was immediately comfortable; that she could be propped up in bed and still remain comfortable, that clinically in fact the treatment was almost perfect and the result was such she could allow her limb to be flexed like that and sit up in bed, while before the use of the apparatus you could not go near the bed, nor touch her without the old lady flying all to pieces. So whatever the discrepancies may be in these specimens, of which I am not competent to judge, in regard to the pathology of these cases, clinically the treatment is excellent and I believe we know of no better at the present time.

Dr. H. Jerard, Pleasant Hill, Mo.: Several years ago I had an old lady about 70 who tripped and fell producing an abnormality of the kind under discussion, or something of that character, in the region of the hip. I read up pretty well in all the literature that I could pertaining to the subject, Dr. Senn among the others, and I concluded the prognosis was exceedingly bad and told the woman so. I did not expect to get any results which were at all favorable, nor did I. I treated her along the lines laid down in text-books. I had not heard of this treatment. It seems to me this fits it exactly. The philosophy certainly is right and I would like to ask Dr. Ruth if he has treated any cases of this kind which did not make a good recovery.

Dr. F. B. Dorsey, Keokuk, Iowa: I have collected radiographs of 10 patients who had what was diagnosed as intra-capsular fractures of the neck. Seven of these radiographs proved conclusively that they were impacted fractures; only 3 showed clear fracture. I have these radiographs in my possession. They were all treated by this method. They were free from pain after the application of the dressing, they got along well and had good results.

I merely state this to show that we are not always correct in the diagnosis of a clean fracture and forget to ask ourselves the question if this is not an impacted fracture, and we are patting ourselves on the shoulder and on the head and saying that we always get these excellent results due to our diagnosis and yet we don't recognize the fact that there was an impaction.

Now, another fact that I noted in these radiographs, in the 3 which were not impacted there was apparant shortening of the neck. One patient has a law suit pending and she is quite lame. Yet I think that as soon as the case is decided she will walk better. (Laughter.)

Dr. Ruth (closing): I am very sorry that Dr. Grant makes me out such a liar, because I happened to treat some of these cases myself that he says are impacted. And they certainly were not impacted, though Dr. Grant sets up his judgment in the matter against the evidence existing at the time of shortening in both of these cases, with complete eversion and preternatural mobility. You can have no impaction in any case under such conditions.

Dr. Grant has just as good a right to his opinion as I have to mine. But the fracture line on this specimen is quite plain to me notwithstanding 20 years' lapse of time between the fracture and date of death. In this case, Gentlemen, I want you to look at it carefully now and see whether or not you think honestly if that patient had lived for a year that Dr. Grant or any other man on earth could have told that a fracture had existed, and yet Dr. Maxwell treated this case and began his treatment a week after the injury when there was then 1½ inches of shortening, complete eversion, flattening of the hip and preternatural mobility with crepitus. Now that is the record of that case as I got it from Dr. Maxwell at the time and I saw the case, with Dr. Maxwell, measured the limbs before death and was present at the post-mortem. There was no shortening discoverable.

This specimen is the only other one that if left of this list. This case was treated by Dr. J. H. Colter and by Dr. O. D. Walker. This I have not cut open. It is a pretty frail bone. I can not say that that was not impacted. But the record says that there was 1½ to 2 inches of shortening. You know there is not more than ½ inch of shortening now.

I appreciate Dr. Grant's desire to always have the exact differentiation between intra- and extra-capsular fractures. I have long believed that it was difficult—and in many cases absolutely impossible—to differentiate. Of course, if you have no crepitus, if you have only a comparatively slight shortening, say ½ inch, moderate or maybe no eversion, that you probably have an intra-capsular fracture, if you have solution of continuity at all. I have seen but 1 case of true impaction. I have never advocated violent extension or manipulation of any kind—the gentlest indeed. I never advocated even extreme and persistent effort to secure crepitus. In most of these cases diagnosis was made under anesthesia.

I want to say, with reference to a shadowgraph, that I believe there is nothing more deceptive. There is the worst specimen in the whole collection. I am frank to state to you my belief that in no direction could a shadowgraph have been taken of that bone showing the fracture right. It would have showed shortening truly, but I do not see in what direction a picture can possibly be taken that will enable you to get through the fracture line and show you have one because you get the mass of the bone here in a position which will make a thick, dense shadow.

I am asked in regard to the treatment of impacted cases. Dr. Moore of Minneapolis advises the breaking up of an impaction and treating it by this method in view of what I believe to be a certainty that you will get union, because in most of the cases it does loosen up some and there is progressive shortening. If the impaction is firm and in good position—leave it alone, but if it is in bad position I would not hesitate to break it up, but if it was in fairly good position, of not more than ½ inch shortening and the movements not particularly restricted I certainly would not think of breaking it up, nor would I put on any heavy extension, and nothing except mod-

erate restraining influence would be required.

Now as to the results: I have been asked if in any of these cases we failed to get union. I have failed to get union in 4 cases out of 12 in persons over 80. In my report I state there are 4, I think, in which union did not occur—treatment was continued only 1 to 3 days, a very good reason why we got no union. The individuals died of some other malady or injury. I know of no case which has lived and been treated for four weeks by this method where union did not occur, and so I say I believe it will occur in all the cases. If there had been a single failure to my knowledge in the whole 100 cases which have been reported to me I would have absolutely no right to make that statement.

Truly I am sanguine in reference to it because I have collected probably more evidence in the matter than anybody else and I know nothing against it. I think I am not foolish enough to be prejudiced in its favor. I hope not. I believe in young children that Whitman's plan will do quite as well as this.

If I have omitted to answer any questions that I should have or make clear any points, I will be glad to do so now.

Question by a Member: Do you use the weight in impacted cases?

Dr. Ruth: Certainly, in a mild way, but I never attempt any forcible reduction. As I have said, I have seen but 1 which was impacted. Dr. Grant believes that these are, but Dr. Grant is mistaken. That is a difference of opinion. I was there in the most of these and I know Dr. Grant sees the results and he thinks he knows, but he is mistaken.

Dr. Grant: But you have pathology there that would indicate impaction.

Dr. Ruth: The pathology indicates absorption not impaction.

Only a few examples of *sciatic hernia* are on record. It occurs through the great sacro-sciatic foramen, and the swelling so formed constitutes one of the sub-gluteal tumors. It is moreover, one that possesses an expansile impulse on cough, which fact in itself will serve to distinguish it from many of the other gluteal swellings.—*Eccles.*

TREATMENT OF SPRAINS.*

FERD. ENGELBRECTSON, M. D., CHICAGO.

By a "sprain" we understand an injury caused by a movement beyond the normal range of articulation, short of dislocation, and produced as a result of some violent force. The degree of the injury sustained is in ratio to the tension of the structures involved and the force overcoming this tension. Hence the lesion may vary from a slight strain to extensive lacerations of the affected tissues. Primarily, capsule, ligaments, tendons and their sheaths, blood vessels, lymphatics, nerves and even the bone may be more or less torn apart.

This produces from the first a simple traumatic inflammation, with its five cardinal symptoms, pain, local temperature, swelling, redness, if superficial, and impaired function. In addition we have more or less internal hemorrhage and local nervous lesion. The inflammation may be located in a circumscribed area of the synovial membrane, or extend to the whole articulation and surrounding structures, depending on the extent of the injury. Secondarily, we have to consider induration, adhesion, contracture of fascia, ankylosis, deformity, atrophy, permanently impaired function, local paresis and auto-infection as possibilities, if not probabilities, as a result of inadequate treatment. With rational treatment, none of these complications need to be feared, except possibly auto-infection in an individual suffering from a systemic infection.

In considering the treatment of sprains our aim must be, first, to prevent inflammation and effusion, or, if this has set in, it should be reduced as soon and as much as possible, in order to prevent the additional injury to the cellular elements from pressure, intracapsular and otherwise. Secondly, to promote the repair of the torn structures in such a manner as to prevent any secondary complications. That this would be most admirably accomplished if the circulation of lymph and blood could be so accelerated as to prevent stasis and congestion, absorb any

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effusion and extravasation present, can hardly be denied. Such an increase in the circulation would naturally stimulate the cellular activity tending to repair the ruptured structures. The means to obtain this desirable result we have in massage, passive and active movements, at once, and continued two or three times a day, if possible, in fresh sprains. This treatment is not new. Hippocrates used it in similar cases, and it has been extensively used by laymen in many countries.

Bonnet introduced massage as treatment in joint diseases to the medical profession about 1850 and later Mezger attracted much attention by his article, "Die Behandlung von Distorsio Pedis mit Fricties." Massage is now and has been long accepted as the rational treatment for sprains in France, Germany, England and the Scandinavian countries. The superiority of this treatment over all others for sprains is well established. The period of recovery is reduced at least two-thirds of time under this treatment, and most, if not all, secondary complications are prevented.

I am only able to present data of 69 cases from my rather incomplete records, as follows:

		No. of Treatments:		
Sprain of	Cases.	Ave.	Max.	Min.
Ankle	31	11	23	2
Knee	17	16	51	3
Wrist	8	12	39	2
Shoulder	6	43	139	8
Elbow	4	38	61	13
Back	3	34	52	25

These cases range in degree of injury from a mere strain to the most severe lacerations, short of diagnosed fracture.

The treatment in a few cases was commenced early, but in the majority months after the injury, after physician and patient considered permanent invalidism as probable. This explains the great difference between the maximum and minimum number of treatments. In cases like this, if massage had been commenced at once after the injury, the average number of treatments should not exceed 50 per cent of those given here. I cannot emphasize enough the importance of *early* massage in such injuries; if possible, at once. It is most surprising for anyone not familiar with this treatment to see with what rapidity even severe sprains recover; in fact, the patients do not realize that they are severely injured. This was very well illustrated in two cases with identically the same injury, namely, rupture of the ilio-lumbar ligament, probably involving lumbo-sacral ligament, and a unilateral synovitis of the sacro-vertebral articulation.

Mr. W., railroad fireman, sustained this injury on the left side November 17, 1904. Over six months after, on May 29th, massage was commenced. Up to that time patient had been unable to bend forward or backward on account of pain and considered himself crippled for life. It required 52 treatments (two months') to restore him to normal condition in which I succeeded.

Mr. W., railway express messenger, sustained the same injury on the right side, about September 20, 1907. Massage was commenced September 21st, was repeated every day until September 27th; patient at this time resumed his work and took his treatments between his trips, 25 in all, the last treatment on November 15th. The difference is, 8 months invalidism in one case; in the other, 2 months, all of which time but one week in active service, and the last patient complained that a little thing like that should last so long, while the first thought I had performed a miracle on him. Both men were young and in the best of physical condition outside of the injury, and it is my belief that if the first patient had received the same attention as the last, his recovery would have been as rapid.

Berghman's statistics are very interesting in this connection: He treated with massage in Stockholm 145 cases of acute traumatic joint affections (sprains, synovitis, with and without intracapsular hemorrhage). In 104 of these cases massage was begun within four days after the injury. He gave 12.44 sittings on the average. In 41 cases which were not treated until five to eight days after the injury the number of sittings averaged 17.60.

In 33 cases that did not come under treatment till from nine days to three months after

the trauma, the average number of sittings was 44.68. All of Berghman's cases were treated twice daily.

The technic is simple, not as difficult to master as some other manipulations with which the physician must be familiar. In fresh sprains the work is not so tiresome. The only objection for the busy practitioner is the time it requires, and for this reason such cases are often referred to some specialist in this line, if available.

What I consider the ideal routine in the treatment of fresh sprains is as follows: Direct that an ice bag be kept on the injured part every alternate half hour until pain ceases or the patient can be attended to. This applies to fractures as well; it will arrest inflammation, and, notwithstanding assertions to the contrary, I do not believe any injury can be caused by the ice bag if applied in this manner. After reaching the patient, commence treatment by centripetal strokings, at first with light, then moderate, later hard pressure. Use a bland non-irritating fat as a lubricant. Apply the palm of one or both hands to fit the area manipulated. This should be the region proximal to the injured parts, gradually extending the manipulations to cover the seat of injury. Special attention should be given to the region draining the parts affected. The object is, of course, to reduce peripheral resistance of the blood supply to the parts injured. The greatest attention must be paid to any intracapsular effusion and attempts be made by this means to reduce the same.

The treatment is continued from 15 to 30 minutes; it may be very painful, but patient is relieved from all pain immediately on the termination of the treatment. This is repeated twice daily, and between the treatments the patient is directed not to move the injured part too much. A compression bandage is also applied between the treatments, if practicable. At the termination of the centripetal strokings, at each sitting careful passive movements should be given. There is no danger of any tearing or displacement of the soft tissues, as the movements are performed slowly, within physiologic limits, and tendons and aponeuroses, the structure mainly involved, are non-contractile. These passive movements prevent adhesions and are therefore very important. As soon as the swelling has subsided the active movements should commence, followed later by active movements, with resistance gradually increased as the patient gains strength.

70 State St.

DISCUSSION.

Dr. L. W. Littig, Iowa City, Iowa: I am afraid that I, like the majority of men engaged in the practice of medicine, am not a skillful masseur. The results reported by Dr. Engelbrectson are certainly very good.

I was very much pleased with the paper for one reason. Each one of you gentlemen has received a printed sheet from the chief surgeon, and on that printed sheet you have noticed the statement that all sprains shall immediately be put into a fixed dressing, a plaster cast. Dr. Engelbrectson, with his big stick, I think, at least has put some cracks in that plaster cast.

Now, I want to confine my remarks especially to sprains of the ankle joint and to recent sprains. I believe there is no dressing so efficient as the Gibney dressing. This consists, as most of you know, and as perhaps all of you know, of adhesive strips which reach from the middle of the leg on one side almost to the knee upon the opposite side, the longer strip being placed upon the side which is injured. In applying this dressing an adhesive strip of probably an inch in width is placed upon the middle of the sound side of the leg and then is brought under the heel and up on the injured side, making considerable traction. The second strip is placed around the heel parallel with the sole of the foot, and of course crosses the first strip. Like strips are applied alternately until the foot and ankle are covered.

You are surprised to see how well your patient will walk within a few hours after the application of this dressing. The instructions that go with the method are to insist that your patient walk, and I remember one instance, a rather nervous woman, who said she could not walk. I insisted, and taking her by the hand led her around the room, and

she walked with considerable pain and difficulty, but the next morning she was in the kitchen doing her housework, and she walked, she said, without any pain at all.

Another case was the local agent of the Rock Island road, who had a severe sprain of the ankle; the same dressing was applied in the same way, and he was enabled to go about his work without any loss of time. I ought to have said that a roller bandage is snugly applied over the adhesive strips for the first 24 hours, when the roller bandage may be removed.

Now, notwithstanding the presence of the chief surgeon, I believe I may venture the statement that the Gibney dressing for sprains of the ankle joint, especially for recent sprains, is far superior to the plaster cast. But I think the masseur can accomplish much more with old sprains. I believe this dressing is adapted especially for recent sprains, and I know it does very nicely about the ankle joint.

Dr. S. C. Plummer, Chicago: Dr. Littig has been wanting to say that to this Association for two or three years. He has been afraid to say it because he remembers a clause in your contract, particularly emphasized, which says that all cases of bad sprain must be put in a plaster cast after some preliminary dressing, and he did not wish to say anything which conflicted with the instructions in that contract.

Now, that, of course, was in the contract before I was appointed chief surgeon. It was put in by Dr. Middleton, my predecessor, and I have thought it best on the whole to leave it there, although I confess I do not follow it out myself. But I am situated differently from what most of you are, in that I have Dr. Engelbrectson very handy to refer these cases to.

In regard to the Gibney dressing, which Dr. Littig speaks of, I have used that in a number of cases and I know it is quite efficient. Whether it is efficient in all cases or not, I am not able to say. I notice that Von Bergmann describes it and says it is all right for mild cases, but he does not believe in it for the more severe ones.

But the treatment that surpasses all others, and the efficiency of which surprised me, when I had the opportunity of observing it, is the treatment which Dr. Engelbrectson has spoken about here. I could not reconcile myself to starting these patients out where very severe sprains have been received, without any dressing, without any hot applications, simply giving them massage right from the start. It took Dr. Engelbrectson quite a while to persuade me to allow him to do that. Finally one day a man with a severely sprained ankle came into my railroad office, and it was a sprain which I knew from comparison with others which I had treated first by hot applications and then the plaster cast, would have taken 6 or 8 weeks' treatment before the man would have been able to return to work. This man was one of those ambitious men who was extremely anxious to get back to work. He emphasized that very much, saying that he could not afford to be idle and that he had to get back to work just as soon as he could. I told him it would be 6 to 8 weeks before he could resume work. He was very much crestfallen at this, so I said to him, "If you are game and can stand getting hurt, I think maybe we can get you well sooner than that." He said he would do anything to get well at the earliest possible moment. So I sent him over to Dr. Engelbrectson, who gave him the first treatment a few hours after the sprain. The result was that the man got back to work within two weeks. He remarked afterwards, "It hurt like blazes, but I like to get well quick, anyhow."

The results in sprains when treated early are very good. Dr. Engelbrectson has treated a number of others since the instance mentioned, and the treatment, while painful, does give quick results. He says the quicker he can get them after the injury the better. If he can get the patient within an hour or two after the injury, the recovery will be quicker than if four or five hours elapse before treatment. Of course, it is very hard, generally, to reach the patient to give the treatment within an hour.

Now, in regard to that paragraph in your

contract, I still think for the average man that, perhaps, is the best treatment, but if you can get the services of a skilled masseur, or if you can learn to do it yourself, I should certainly advocate the treatment by massage. One great trouble about referring cases to a masseur is as soon as you say, "Now, you ought to have that massaged," "Oh, yes, an osteopath." We do not like to encourage those osteopaths. They treat all pathologic conditions on some absurd theory, and they are just as likely to treat by massage a condition which cannot be benefited as they are to massage a sprained ankle which they can help. These osteopaths can help a certain class of cases, but they are likely to undertake to treat all kinds of cases.

Now, Dr. Engelbrectson is not an osteopath, I am happy to say. He is a skilled masseur, taught in Sweden, where they excel all others in such treatment. I think it would be most fortunate for the profession if we had more really scientific masseurs, men who understand the business, who knew the cases which should be massaged, as well as the contraindications. For an osteopath there are no contraindications; all cases are amenable to his treatment. When Dr. Engelbrectson gets a case that is not right for massage, he examines the patient and sends him back with a note saying that the man is not yet ready for massage, or that this is not a case for massage, or that the patient cannot be helped in that way.

I think the time will come when we will have more specialists of this sort, intelligent, educated masseurs, and there is a great field for them. But we have got to get out of the minds of the people the idea that osteopathy and scientific massage have anything in common.

Dr. Engelbrectson (closing): In regard to the dressing mentioned, I wish to say that in mild cases this dressing certainly would be good. In fact, in mild cases all the treatment that is necessary is a roller bandage, and the patient goes to his work without further treatment. But I think that no one who knows what synovitis of the ankle joint is would agree with the statement that a patient with that affection should walk immediately after a severe sprain under any treatment. I have seen people contract synovitis from being too heavy and too much on their feet without any accident at all, and without any infection. And if synovitis is produced in that way I think no one would advise a patient so afflicted to walk right after a sprain under any conditions. There is one other thing: it is stated that massage may be good for old sprains. That is true, but if the recent sprains are attended to right, we would not have any old sprains.

BURNS AND SCALDS OF THE HEAD.*

W. F. MORROW, M. D., KANSAS CITY, MO.

Burns are produced by the application of fire or dry heat and scalds from hot fluids or moist heat. There are various degrees of burns, according to different authors, but I will not occupy your time in discussing these various classifications. Suffice it to say that the burns or scalds I will consider will be the class or degree which practically destroys all of the layers of the skin or involves subcutaneous tissues.

Burns are dangerous when there is considerable surface involved. Burns or scalds over the abdomen, chest and head are more liable to fatal termination than elsewhere on the body or limbs. The head being the most serious part that can be involved.

It is not my purpose to go into the subject in extenso, but to put before this Association sufficient material for thought to elicit a lively discussion of this important subject to patients and surgeons. I have formerly discussed, in a general way, burns of various parts of the body and limbs, but desire to direct the major part of this discussion to burns and scalds of the head, which, of course, includes the face. My purpose for this is to have a general expression from members of this body directed to the special importance of the pathology, complications and treatment of burns of the head.

It is claimed by clinicians that burns of the abdominal surface and of the chest are danger-

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ous from the fact that they are more apt to attack or affect underlying organs. If that be true, which I presume is not questioned, how much more would burns of the scalp and face be likely to produce injuries and disease of the brain and its coverings.

Burns of the head are usually from steam or hot water, though they may be from the dry variety. I am inclined to believe from my limited observation of this class of injuries, that we underestimate the damage done to the brain and the meninges. Of course, there are a great many authors who have investigated and demonstrated in the dead room as far as it was possible for them to determine the conditions and changes found following the injuries of this class on the human subjects, as well as the lower animals, as to the real effect of burns and scalds. Some claim the injury is the destruction of red corpuscles and blood plaques; some a disturbance of the vasomotor nerve centers disorganizing the circulatory apparatus; some the effect burns have upon the heat centers of the body, and also to the destruction and injury to the end organs from large surface burns, but I take the position that while these conditions are present, yet I have an opinion that there is some room and excuse for further investigation of the effects upon the central nervous system.

The constitutional effects are usually divided into three stages, according to different periods, stages of collapse or shock, inflammation and repair.

A severe burn will produce a shock unlike the shock of almost any other injury. The shock is profound. In proportion to the extent of the burn and location affecting different patients according to their nervous sensibility. Shock usually continues from a few hours to 24 or 48 hours. During this stage the patient may be lifeless, though the mind may be clear, yet seemingly unconscious of their injuries. Other cases with less injury of nerve centers will cause spasms, rolling and tumbling over the bed, with an outward expression of intense and almost unbearable pain. The temperature during this stage is very frequently subnormal, the respiration shallow and hurried, pulsation accelerated and feeble, skin pale, cold and clammy.

If the patient survives this stage, then reaction will be established and the general conditions will begin to assume a normal condition, the temperature will rise, the respiration be improved, the cold sweat subside by the increased temperature and the patient will oftentimes express, at this stage, the first evidence of pain. This is the beginning of the inflammatory conditions or stage, delirium may or may not be present.

Following the inflammatory action we have suppuration as a result of infection, and when we have the entire skin involved we are most sure to have the presence of microörganisms, it matters not how careful we may be to prevent it. When we have considerable pus, the eschar will be liberated sooner by the peptonizing or liquefying action from its presence; so it is possible its action may be a blessing in disguise by aiding the separation of the necrotic from the living tissues.

We understand that the means producing these injuries would have a tendency to render the wound antiseptic, but we are all aware of the fact that the skin of the human body is naturally inhabited by pyogenic microbes, and when we have at the margin of the burn healthy skin which is in direct contact with the pathologic conditions, then we may expect an infected wound. While it is our duty, as far as it is possible to maintain and protect these wounds from the invasion of microörganisms, yet how often we fail to do it. With the burned scalp involving the entire cranium with that particular formation of the skin covering the head, with the hair upon the scalp, you will find that it will be the next thing to an impossibility to prevent the invasion of microbes into this area destroyed by heat. It is far more liable to be an infected area following severe burns than any other portion of the external human anatomy.

Following the suppurative stage, the process of repair will take place. After severe burns the repair process is necessarily very slow because of the fact of the deteriorated condition of the cellular structures that survive the injury.

The complications that usually arise may be manifested in the first few days or they may

be manifested from a few days to a few weeks. The complications may involve the intestinal tract, pleura, lungs, liver, stomach, or the coverings of the brain, even the brain itself. There are different theories regarding the cause of these complications.

According to Ponfick and Schmidt, in many severe cases the blood or blood plaques have been found, on microscopic examination, changed in appearance, being altered in form or separated into small bits. Such a condition is conducive to thrombosis and stasis in various organs. These infarcts the result of absorption into the circulatory system, permeating the various organs of the body, are of themselves causes for the development of localized infection which is always manifested by rigors and elevation of temperature, characteristic of the infection.

These complications or secondary conditions which are manifest in the repair stage or subsequent thereto, are unfortunate terminations. In such cases the patient is already in an exhausted condition on account of the great tax upon the excretory organs of the body that have been overworked and underfed. The outlook under these circumstances is always more or less unfavorable.

It has been my misfortune during the last few months to have had 3 patients who were severely burned. However, as I have specialized the scalds and burns, I will have to exclude the other two because they were not scalp injuries.

I wish now to report a case which was under close observation for eleven long weeks. Mr. J. P., aged 47, a railway engineer, was injured in a wreck September 10th, about 7 o'clock p. m. The patient was attended at the wreck by another physician who brought him in an ambulance to the University Hospital, at Kansas City, where I was called to take charge of the case.

This unfortunate individual was found suffering from great shock and with excruciating pain. Subnormal temperature, feeble, thready pulse, labored respiration and in a cold clammy sweat. I proceeded to remove his clothing and incidentally wish to state that I am never careful with the preservation of clothes overlying the burned human subject, cutting them in every conceivable direction to enable the removal with the least injury to the patient. In this case there were burns on both hands, wrists, ankles, knees, elbows and right shoulder. (I simply refer to these to make the report of the case complete, the head being the principal burn.)

His head, at the time I saw him, about 9 o'clock, was as large as a good sized water bucket. His eyes were completely closed by the swelling. His neck was covered with large blisters. His mouth and lips were swollen to as large as the thick part of one's hand; nose apparently destroyed. The upper half of his right ear was burned off, and his left ear was severely burned. His eyes, after the swelling subsided so they could be seen, were intensely red and inflamed, but no ulceration of the cornea.

This patient continued in the first stage of constitutional disturbance for about 48 hours, after which there was a reaction followed by the usual course of changes of condition at this stage. The case continued in this stage with a temperature from 101 to 103°, with pus formation over the hands, in fact over every point injured, and more especially that of the head. There were large pieces of necrotic tissue that I was able to get from his nasal cavities and from his ear canals, which were suppurative. The hair was matted in this eschar or necrotic tissue and the final separation did not take place for about two weeks. He had a fairly even temperature. During this period slight delirium existed throughout this inflammatory state following the shedding of the slough.

The granulation process was feebly established upon the scalp and face. He continued to have some suppuration, though diminished on account of the protection afforded by the granulation wall. There was a slight decline of temperature and as the suppuration lessened there was a corresponding diminution, his temperature assuming about a normal condition.

In the beginning of the fourth week the delirium was increased and continued to increase day by day until the patient was almost a raving maniac. With this increase of delirium the temperature at first was accelerated. Very soon

there was a tendency to decline or a reduction in the temperature. It dropped to normal and continued to drop until it reached 96.8° in the axilla.

The patient at this stage refused nourishment, or could not swallow, and his condition appeared absolutely hopeless. During all this time he had to be kept under close observation by competent nurses day and night to restrain him and keep him from jumping out of the window. When the patient refused or failed to take nourishment nutrient enemas were resorted to, continuing their use every four hours, the following formula, preceded by a normal salt solution about one hour: One pint rich milk, 2 eggs, 2 oz. whisky and 2 tablespoons full of beef peptonoids. This was happily retained and bridged over this chasm until the patient was able to take nourishment again in the natural way.

The patient then ran this regular course for about two weeks, his temperature ranging from 96.4° to normal, closely husbanding his strength and giving him proper nourishment and stimulation, as much as it was possible for him to take, during this period of standstill in his case. Some suppuration of the face continued in his ears and forehead.

I neglected to say that at the back and behind the right ear there was an opening as large as a lead pencil which extended down along directly toward the bony canal to the depth of an inch or more. There was considerable pus flowing from this opening. The pus continued to flow from his ears and his nasal cavities up to the seventh or eighth week following his injuries. There was a slight improvement in his physical condition, though the delirium continued. His eyes were inflamed and the lower lid of his right eye was drawn down by the scar tissue on the lower lid, preventing him from closing this eye which contributed to a continuation of the inflammatory condition. There was a dilatation of the pupils and an occasional contraction during this period.

His improvement continued and his mental condition began to improve. I was unable to obtain any reliable information from him, up to the eighth or ninth week, relative to any localized pain which he may have had and when he was able to communicate with us he told us that he suffered with intense pain around his ears and in the front part of his head. The complication which resulted from the injury to his head principally was that of meningitis. The extent of which I am unable to state.

Te patient finally, the last week or ten days that he was confined to the hospital, was able to talk rationally if one would engage his attention direct, but the delirium at nightfall would set in again and it was difficult to control him. It was necessary during all this period of mental derangement to confine him to bed by means of straps and bandages. I allowed him to be removed to his home, leaving the hospital November 26th, at which time he had almost completely recovered his mental facilities.

The treatment of this case I will only summarize as follows: I used the oil treatment at first (linseed sterilized). Next I used olive oil, 3 parts and camphophenique 1 part in combination immersing sterile gauze in the mixture and applying it two or three double thicknesses, continuing the use of this formula until the necrotic tissue was thrown off and healthy granulation established. I then used dry dressings, but I very soon abandoned them because of the pain it caused in their removal. I used the picric acid paste only once and the pain was so great I did not again resort to it. I cleansed the parts with warm boric acid solution, then applying the olive oil and camphophenique in the proportions above stated with, I think, the best results. When the granulation was established I used a dusting powder of bismuth subnitrate and acetanilid, 2:1. On his face I would have the nurse apply warm gauze saturated with boric acid solution. The nasal and auditory canals were syringed out with the same solution warm.

I was about to forget to refer to the use of unguentine which I used for quite a while during the granulating stage. I would spread it on a piece of sterilized gauze and apply sterile absorbent cotton and cover this with a bandage.

This is, in brief, about the local remedies used and the stages stated.

The general or constitutional treatment consisted in the latter part of his illness. Stimulants, well selected nourishment. Morphin in

from ¼ to ½ grain doses to control nervous condition and produce sleep during the maniacal stage. We gave him an alcohol friction bath nearly every night and he would seemingly rest better. Normal salt enemas were used almost daily, even when not using rectal feeding. As soon as we felt that he could stand it we began to give protoiodids, which were kept up for the latter part of his hospital confinement.

DISCUSSION.

Dr. H. B. Hemenway, Evanston, Ill.: I hope I may be excused if I take a little side-shot at the paper. My attention has been recently called, and called very emphatically, to the way the doctors are used as advertising agents for various proprietary formulæ. Reference is made to camphophenique. If I remember correctly, it is not very long since the Council on Pharmacy of the American Medical Association showed that camphophenique was not what it claimed to be. These proprietary firms are publishing partial formulæ oftentimes, but they are also keeping hidden in a great many instances important elements in their compositions. The more we use these ready-made preparations, I do not care what they are nor how efficient they may be—the more we use these ready-made proprietary mixtures the less we know about our business.

My attention was very recently called to a little thing occurring in my own practice. In the case of a patient from whom I received no money, as she was not able to pay me, I used an ethical proprietary preparation which worked first-rate, it was recommended by this patient to the wife of one of the most prominent manufacturers of this section of country; she used it and recommended it to her next friend, and so it went the rounds until it came back to me, —"Why, you recommended this to so-and-so." The point I want to make, and make just as strong as I can, is that the more we used these proprietary preparations of which we know but little, the more indefinite does our knowledge become as to what is the efficient remedy used. Therefore I wish to enter a protest against their use.

Dr. E. E. Barrett, Glencoe, Minn.: Any one who has as a patient a little child suffering with a severe burn, I think would forget all bickerings over those remedies or anything else. If there is anything under God's heavens that will relieve a suffering little one, I am willing to use it, whether it be hydrogen peroxid, unguentine, or what not. The subject before us is that of burns and not of anything else, and when a discusser branches off in a manner like that, we are, I believe, in danger of forgetting the subject. I am willing to come here and spend my time in learning something new and better upon the subject of burns, for it is something near to our hearts. We have all seen our neighbor's child if not our own die under our hands in a few short hours, we have seen these little patients suffering untold misery, we have been accused of causing death from the administration of chloroform or morphin when we have done the best we could. I am interested in the subject, and would not like to see it branch off in any way other than giving us facts in a manner that will help us in these cases.

Dr. R. L. Murdy, Aberdeen, S. D.: The subject of burns and scalds is one upon which I have some very positive opinions as to the method of treatment. I believe that if we would spend as much time in the consideration of how *not* to treat these cases as we have spent in learning how to treat them with all sorts of salves and proprietary remedies, we would materially advance the methods of treatment of these injuries.

Personally I believe the treatment of burns and scalds should be very simple, confined largely to dry dressings and no treatment at all. Of course, where we have deep and extensive burns with destruction of all the skin, it is necessary to use wet dressings perhaps to remove the slough as hastily as possible, but where the burn is shallow, not involving the deep tissues, I am very much in favor of the method as brought out by a St. Paul physician —the method of treating by hot air and a little dusting powder. Of course, this can only be done where the part is not subject to pressure and where there is no irritation from clothes or bedding. For a limb it is easy to carry out this method. The blebs can be opened and

drained and the skin be dusted with a little stearate of zinc, and Nature very soon forms a coating that is better than any unguentine or camphophenique or any proprietary remedy, it is better than anything we might select out of the U. S. Pharmacopeia, and it has many advantages. If we dress our burns, using salve and gauze, as fast as we have a few granulations spring up we remove the gauze and tear off the granulation with it, the result being that we have a long drawn-out affair and the production of a great deal more granulation tissue than if we had treated the case in this simple manner. Therefore I am very much impressed with the method of treating these cases in the simplest way possible. Of course, it is necessary to confine the patient to a very warm room. I believe that if the average burn is treated by this simple method it will give us the best results.

Dr. A. J. Alcorn, Chicago: For local application I have found that sterile castor oil gives the greatest satisfaction of anything I have used. It relieves the pain, it does not induce secretion, and it seems to prevent the formation of scar. It has been very satisfactory in my hands.

Dr. J. H. Rothwell, Liberty, Mo.: Not long ago I had a severe burn of the head. It did not involve the scalp, but all of the face. I used very much the same prescription that Dr. Morrow gave. I did not see the case in the beginning, and it had been dressed with gauze and oil and everything else perhaps that is usually applied as a first dressing, and all the burned integument came off with the dressing. There was a great deal of pain. I used an open dressing, to which I am very favorable. I mixed liquid albolene, which is a petroleum product and which does not saponify very easily, with gum acacia, making a thick emulsion, then added a little cocain, very little, to ease the pain, antipyrin and boric acid. The antipyrin answered every purpose that acetanilid does, it is not as poisonous, it is more effective in easing pain, and it prevents suppuration as much as does acetanilid, yet we do not get any poisonous effects because we do not have to use as much, it being in solution. I dressed the surface open, anointing it very frequently. The gum acacia mixed with an oil makes a flexible dressing, it coats over the wound, and I applied it wherever suppuration occurred, cleansing the part thoroughly. The patient had no pain and the healing was prompt. I like that dressing better than any other to be used about the head.

Camphophenique, made properly, is, 2 oz. of carbolic acid and 6½ oz. of gum camphor; it is a saturated solution of carbolic acid and gum camphor filtered, after it has stood 24 hours take out the excess of camphor and you have camphophenique. It is pure, and it is one of the finest dressings in these cases that there is.

Dr. C. A. Lester, Wabasha, Minn.: The ordinary, minor burns are the ones which we have in our practice much more frequently than the extensive burns. It requires much more ingenuity to treat a severe burn, but it might be well to mention something in regard to the burns we are so much more likely to have. Burns have been divided for convenience into those which result in complete loss and those which do not. In those cases which do not and which we frequently see, for the past five or six years my routine treatment has been one that produces good results in that it is easy on the patient, easy to apply, and there is no pain. Understand, this is where the skin does not come off. A piece of sterile gauze liberally buttered with unguentine, which is aseptic. I am not here to sing the praises of unguentine, but it is convenient, it is an aseptic, oily dressing, it is in an aseptic container that can be carried in your satchel.

In the other class of burns, the skin denuded, I believe the best treatment is to wash the denuded area clean, lay over it sterilized rubber tissue, and on the outside of that gauze, wrung out of sterile boric acid solution. Under this treatment healing is rapid.

Dr. R. H. Hews, Rockwell City, Iowa: In regard to remedies used in the treatment of burns of the first and second degree, I have had good results with ichthyol; about 4 per cent with a lanolin base. We may first cleanse the part well with boric acid solution, but for several years I have had better results from the use of ichthyol than from anything else.

As to methods, several years ago in Des Moines we discussed the question of dry heat and also putting the patient fully under water in a bath tub, thus keeping the air from him. Desiccation with dry heat, kept up to 80 to 100, is very good. But for common burns I have had satisfaction from the use of ichthyol, and it allays the pain.

Dr. E. M. McDonald, Beaver Dam, Wis.: In the treatment of these cases of scalds and burns, the important factor is to allay shock and prevent infection. Patients of mine who have succumbed, have succumbed either to shock or to infection. When, therefore, I see a case of burn, the two points uppermost in my mind are, is the patient in danger from shock or infection? And I have learned to believe that he is always in danger from infection. There are two indications prominently before my mind's eye at that time: First, to relieve pain, and, second, to prevent infection. And I have found in my experience that I can do that more fully by the use of some oily substance impregnated with an antiseptic to keep the wound, large or small, in an aseptic condition. As to the gravity of these cases, I have not found that this was in proportion to the amount of the burn, but rather in proportion to the amount of surface involved; and, again, the location of the injury. I have found that the danger is much greater in burns and scalds of the abdomen than of any other part of the body. I will say that I have not had experience with severe burns or scalds of the head. But I have seen people recover from very bad burns in the locality over the abdomen, I have seen them succcumb to what would appear a trivial scald of the head.

Dr. E. H. King, Muscatine, Iowa: We often get more pain and distress from burns of the first and second degree, simply a blistering, than when the burn is deeper, and the reason for this is obvious. The nerve terminals are irritated from simple arrhythmia, while they are absolutely destroyed if the whole skin is destroyed.

A remedy that has been used extensively, and that I have used to good effect to relieve pain, is sodium bicarbonate, which is to be found in every household. Make a paste of it and cover it over the surface and it will relieve the pain and that is the first consideration—to relieve the pain and distress of the patient, afterwards preventing infection.

A man came to me with a burn received from gasoline explosion. His whole face was blistered and swollen, his eyebrows gone and ears burned. I made a paste of sodium bicarbonate and plastered his whole face with it, dressed it, and directed him to keep it on until I saw him the next day. The pain was relieved. I then removed the shreds of epidermis which had blistered on his face and put on a dry dressing of subnitrate of bismuth, and had prompt healing. Perhaps stearate of zinc would do as well, but after relieving the pain my subsequent dressing was a dry powder. In the case of a child, I never dress a burn without giving an anesthetic, for they are in great distress, and we are apt to frighten them. Perhaps you will have to do this for several days before the condition is under control.

Dr. Thomas McDavitt, St. Paul, Minn.: I desire to state that in my experience in dressing a number of burns in the County Hospital at St. Paul, the usual dressings for burns are absolutely unscientific.

Our friend from Beaver Dam has stated the exact truth in reference to burns—that the dangers come in the first place from shock, in the second place from infection. I do not believe we give Dame Nature the proper chance in these cases. We put on all forms of wet dressings, all forms of dry dressings, we have to pull them off, thus opening up the granulating tissue, and the consequence is infection, and frequently if the burns are extensive sufficient infection to cause death.

Four or five years ago one of our St. Paul physicians brought forward the open method of treatment, without any immediate dressing at all. The temperature of the room is maintained at from 90 to 95°, and it makes no difference how extensive or how small the burn is, the patient is laid upon the bed, stearate of zinc dusted over the burn, with no covering whatever over the patient, and Nature is permitted to scab the surface over. There is no dressing to pull off, no granulating tissue to be opened

up to the air, nothing for germs to get into; Nature is permitted to scab it over and heal it, and the results are astonishing to one who has not tried this method. The results in the City and County Hospital, with a number of manufacturing institutions and headquarters of various railways sending in patients, have been unprecedented in the history of any other hospital in the United States, for by this method great success has been had in the treatment of burns. They have had burns covering the body all the way from 10 to 50 per cent, ranging anywhere from the first to the third degree. This is the only method of treatment now used in either St. Joseph's or the City and County. If any doctor here has been afraid to pursue that method, for his benefit I would like to say that in my opinion, formed from the results I have seen, this is the most scientific method for the treatment of burns that has yet been discovered.

Dr. C. W. Henry, Coon Rapids, Iowa: In the city hospital, where the temperature can be kept at the proper point, a nurse put in charge of the case, etc., this treatment is all right; but we cannot treat burns successfully where we have not the facilities to do it. When we go to see a mild or severe burn, people are frightened and want some kind of a dressing put on. You have to protect the person, and you cannot do it by the method just outlined outside of a hospital. Another thing is, the house may not be in a sanitary condition, and oftentimes when called we do not know what the nature of the case is, and so we have to utilize whatever means we have at hand. Still another, doctors do not always agree as to the best method to be pursued, and if you are treating a case and do not treat it in a manner satisfactory to the people, the other doctor will get the case.

Dr. Miller: I practice in a small town, and wish to report a very fatal case which occurred in my vicinity. It was that of a young lady 20 years of age. Her husband brought home a can of gasoline, filled the stove and tried to light it, it did not light very easily, he left the generator open and was called out to the road by a man who came in a buggy, and was driven to his place of business. In the meantime the young wife went to the stove with a lighted match, and an explosion followed. Two young men driving by heard her screams and rushed up. She was enveloped in flames. They threw a lap-robe around her and rolled her on the ground, extinguishing the flames, then carried her into the house and removed the shreds of clothing remaining. There was not a square inch of her body that was not burned. A physician was called, and this shows what I want to bring out —that people are not always satisfied with the line of treatment we think best; this physician applied linseed oil and lime water and wrapped her in cotton. For three days her screams could be heard a block. They could not give a hypodermic, for there was not a place on her body where one could be given, and she could not swallow, her lips and mouth were so blistered. They sent for a nurse, who used enemata, opiates, etc. On the third day the people became dissatisfied and called a physician from another town. He gave the dry treatment; tore all the cotton off, washed the body thoroughly, getting it in as aseptic a condition as possible, and used a zinc powder, without any clothing on her at all. She was not taking any medicine.

Finally they decided to change the treatment and called Doctor No. 3 and myself. The temperature was normal. I do not know what the pulse was, I could not take it. The tissue was a mahogany brown, just as if the blood came to the surface and you could see it under the tissues. The patient could not speak. She was tympanitic and distended clear up over the diaphragm. I did not change the treatment because I made up my mind the patient was going to die; so I told them there was absolutely nothing to do, and that night at 1 o'clock she died in convulsions.

There are two different treatments: One with oils and a dressing of cotton to exclude the air, the other to keep the temperature of the room up and put on a dry dressing and let Nature take its course.

As to unguentine. About twelve years ago I was called 8 miles out in the country to see a man who had been blistered with steam. An engine was being pulled up a steep hill, the cogs could not hold the engine, which backed up against the thresher that was hitched behind,

and this man was pinned fast between the engine and the feeder. One of the steam cocks penetrated the flesh and the steam poured in up as high as the umbilicus, involving a large area. I had a little unguentine in my grip, which had been recommended so highly by the druggist that I thought I would give it a trial. The man was in pain, almost in convulsions, and the surface was absolutely raw. I applied unguentine over the entire surface, and by the time I was through my patient was asleep. I kept that on for ten days or two weeks, and the surface healed without a cicatrix. I would have used unguentine in the case of the lady had I been called first, but when I saw the case it was too late for anything to be done. But I believe I would use unguentine where there is a raw surface.

Dr. Morrow (closing): I am somewhat disappointed in the course the discussion of this important question has taken. Any man who has had severe burns of the head to the extent that it has been my misfortune to see, I think would have discussed the points that I especially asked for, and that is to consider the pathology and etiology which lead up to this trouble and as nearly as possible figure out something that will give us an insight into existing conditions. That is what I hoped for. I hoped it will never be my province to see another human being suffer as did the poor fellow whose case I have reported here.

For four years I was secretary of the Board of Health of the State of Missouri, and I was just as much opposed as any man in the state to the use of agents which were not considered ethical by the best members of the profession, as well as active in the elimination of quacks from the state. But when you have one of those patients come before you, when you have puzzled your brain and worried as every conscientious physician should do under those circumstances, what are you going to do? And if you feel the interest in these cases you should feel, you will say to your brother physician—What shall I do to relieve that poor unfortunate individual from his pain and suffering? I never used that preparation before in my life. The doctor who just spoke stated that he applied unguentine in his case, and by the time he was through the patient was asleep. Wouldn't you do it, Doctor?

I stand as firm an advocate of true medicine as any man in the United States, and I have the least patience for any man who would attempt to drag down our noble profession into the common quackdom of our country. I used that preparation on advice of the internal medicine man of one of the best medical institutions in Kansas City. If I was wrong, then he was wrong. The patient's anxious mother, who watched him day after day, expecting that any time I would announce his departure, was made happy by his recovery. If I relieved the patient's sufferings by the use of unguentine, and this was the agent that had a tendency to tide him over and allow him to go home in a sleeping car instead of in a coffin, then, Gentlemen, I think I did my duty.

EXPECTANT AND CONSERVATIVE TREATMENT OF WOUNDS OF THE ABDOMEN.*

H. H. CLARK, M. D., M'GREGOR, IOWA.

The surgeon who has any considerable emergency work is sure to face frequently severe injuries of the abdomen. Recently I have had several interesting cases of that nature, and my attention has been called strongly to the study of their proper treatment. While much that has been written about perforating wounds of the abdomen relates to bullet wounds, yet internal injuries of the abdomen, resulting from blows, falls, or squeezes, are not uncommon in the practice of the railway surgeon. A short résumé of the treatment of such wounds advised in recent literature, and a reference to my own late experience seemed therefore pertinent to this occasion.

My somewhat exhaustive reading has taught me that a large number of our authorities are now in favor of operation in penetrating wounds of the abdomen. One author sums up this general sentiment when he says:

*Read at fifteenth annual meeting C., M. & St. P. Railway Surgical Association, Chicago, December, 5, 6, 1907.

"While there may be a difference of opinion in regard to the propriety of operation in individual cases, there can be no dispute upon the necessity of operation in general, when there is a probability of perforation of the intestines, or other abdominal viscera. That it appears to be a well-established fact that all penetrating wounds of the abdomen are less fatal when treated by operation than when left to the process of Nature."

Verco says:

"Although military authors have agreed to leave abdominal wounds alone, as they find that this treatment gives the greatest percentage of recoveries, yet in civil cases, the surroundings being more favorable, the abdomen ought to be opened as soon as possible after the injury and the wounds of the viscera, if any, sewn over."

One eminent surgeon goes so far as to say:

"Until recently a surgeon would have been considered foolhardy had he opened the abdomen for the purpose of searching for, and, if found, of repairing lesions of the abdominal organs. Now, one who fails to perform laparotomy when there is even a probability that viscera have been injured, or blood-vessels torn by a penetrating wound, is considered reprehensible, and without doubt in the near future the surgeon who fails to offer his patient the chances afforded by an operation will be criminally responsible in the event of an unfavorable issue of the case."

Another distinguished authority of this same ultra class commands:

"Open up the abdomen and if you find severely contused intestines remove the contused gut. If a kidney or the spleen has been severely injured, remove."

If this author had had more space, he would probably have added, "Remove anything that doesn't look just right."

From these last citations we gather that the treatment of abdominal surgical affections has outdistanced the diagnosis, so much so, that exploratory incisions must now be made to aid in making a diagnosis. According to one writer:

"The prognosis of penetrating wounds of the abdomen is exceedingly grave, and these wounds usually fatal, when unoperated on. The laparotomy should be done at the earliest possible moment. Shock alone should delay operation, and not even that unless the condition is produced by hemorrhage."

As a supplement to this last, I would quote another authority, who says: "Penetrating wounds of the abdomen generally indicate hemorrhage, and the diagnosis or extent of injury can only be determined by an operation." So you see we have not even the loophole of shock left us, but must operate, if not ante-mortem, then post-mortem.

After reading at length along this line of operative treatment, I came across an article by Winslow which contained this paragraph:

"With the introduction of antiseptic treatment and the advance in surgical knowledge and technique, it was supposed that the question of proper treatment of penetrating wounds of the abdomen had been permanently settled in favor of laparotomy and suture of all lesions. However the faith of the profession had been somewhat shaken by the experience of the surgeons of the Spanish-American, Boer, and Russo-Japanese wars, as many patients recovered without laparotomy, and few where it was performed."

This advice of Winslow's, backed by statistics seems to me decidedly interesting when considered with the advice I have been quoting you from other authors. My own experience during 38 years of practice leaves no doubt in my mind that the restorative powers of Nature are so great that, except in a small per cent of cases, laparotomy, even under the most favorable conditions, is not advisable.

I mentioned in the beginning that I had had recently 3 cases of severe abdominal injury. One of these was a gun shot wound of the pelvis. A 38-caliber bullet entered about the center of the right iliac or inguinal region and emerged 1½ inches to the right of the sacrum. The second was what I first believed to be a fatal injury of the abdomen. The crank of a windlass used in raising buckets of coal struck the patient with great violence. My third case was another gun shot wound. All of these cases I cared for without operative measures and in each instance complete recovery was the result. The third case was the most interesting and I wish to give you a brief history of it.

I was called to attend Robert McW., a young man of 21, who had been shot while at the

home of a friend. I found him in a condition of profound shock, largely the result of hemorrhage. A .38-caliber bullet, fired at a distance of about 5 feet, had entered the abdomen 1½ inches above and the same distance to the right of the umbilicus; had passed through the abdominal cavity and had emerged ¾ inch to the right of the third and fourth lumbar vertebræ. He responded very slowly to the free use of normal salt and stimulants, hypodermically administered. In the course of 18 hours reaction was apparent. His temperature ranged from 90° to 101° during the succeeding 19 days, becoming normal at that time. His pulse, imperceptible at first and extremely feeble during the first four days, rarely reached 65, until the fourth week. Some 48 hours after he was wounded, small pieces of cracked ice were given him. Up to that time his lips and mouth had been simply moistened with water. The patient was kept absolutely quiet; scarcely a muscle was allowed to move. It was not until the fourth day that an ounce or two of milk at three-hour intervals was permitted. Nothing of a purgative nature was administered until the fifth day, when small doses of calomel and soda, followed by oil, were administered. The result was a discharge extremely fetid and black in color. Liquid diet was gradually increased until the 19th day, when he began to have semi-solids. On the 14th day he passed an enormous amount of what seemed to be mucus and shreds of membrane. This continued four days, when his bowel movements became nearly normal. There was free drainage from the wound in the back up to the 17th day, when the opening closed. When discharged the patient declared that he felt perfectly well except for pain in the right leg. He had a decided limp for two weeks. This we attributed to the fact that the bullet had made its exit near enough to the spinal column to injure a spinal nerve.

The bullet in its course must have perforated the small intestine and transverse colon, because as has been demonstrated a bullet fired through a body shows no deviation in its course, but passes through in a straight line and that a bullet will not glance from its course by meeting soft tissue. An incision made directly in the course of a bullet will always give the shortest route to the injured part.

In this case Nature did the healing by allowing the mucous membrane to become everted or protruded through the wounds, effectually plugging them. We assisted Nature in this eversion of membrane or plastic lymph by keeping the patient rigorously quiet and the wound aseptic.

This case, together with all my other cases of penetrating wounds of the abdomen, has firmly convinced me, despite everything our authorities may say to the contrary, that the ability of Nature to care for such injuries is so great that even our most eminent surgeons with the best hospital facilities are not justified in operating for diagnostic purposes except in a small per cent of cases. If this is true, what then can be said of those authorities who advise such laparotomy under nearly all conditions?

A large per cent of abdominal injuries must of necessity be cared for in surroundings unfavorable to operation, and by men who are not greatly skilled in the technic of abdominal surgery. It is obvious, then, that when brought face to face with a severe injury of the abdomen, they are hardly as well qualified to battle for life with a scalpel as is Nature with its great restorative powers.

Such surgeons as Murphy, Bouffleur, Andrews, Van Hook, and those Minnesota gentlemen who have removed the appendices, ovaries and gall-bladders of the citizens of Minnesota and the Dakotas, may be justified in resorting to diagnostic laparotomy in a certain per cent of penetrating wounds of the abdomen, but for the ordinary surgeon to do so is nothing short of criminal.

Imagine our country doctor out in a prairie shanty or an isolated railway station attempting diagnostic laparotomy, and it is in just such places that many emergency cases are cared for. Following the commands of one author I quoted, this doctor opens the abdominal cavity, carefully goes over the small intestines in search of possible lesions, and after

the intestine has been sufficiently pawed over, he raises the spleen, bladder, kidneys, and liver. In the event of the death of the patient, it would be hard to tell which was the more reprehensible, the wise surgeon who commanded or the fool who followed his dictates.

The ordinary surgeon has no business with laparotomy for diagnostic purposes, and I believe that even in the hands of our best surgeons exhaustive methods of examination are pernicious.

Every case of abdominal injury is of course an individual one, and instances come to all surgeons where operative measures for treatment must be used. But I am convinced they are a small per cent. Generally speaking, it seems to me it is our imperative duty to let Nature instead of a doubtful laparotomy do the repair work. Keep the patient perfectly quiet, give the digestive organs absolute rest, keep the wound aseptic, establish thorough drainage, and then stand quietly by and watch Nature's marvellous agents effect their cures.

DISCUSSION.

Dr. I. K. Gardner, New Hampton, Iowa: In the matter of the expectant and conservative treatment of wounds of the abdomen, I have recently looked up some of the literature giving the medical and surgical histories of wounds of this character occurring in the War of the Rebellion, in order to find what methods were employed and what the results were. I found they had some 8,000 cases, of which the percentage of deaths was 48.8 per cent (practically half). How did they treat those cases in the War of the Rebellion? We have no statistics today so complete as those; they were reliable and complete and anyone can refer to the volumes containing them.

Those wounds were treated with opium and rest. That was all right; if the surgeons could have limited their intervention to this treatment alone, I have no doubt that this percentage to deaths would have been very much lower, but almost invariably the surgeons had a tendency in those days to stick into those penetrating wounds septic fingers, or an unclean probe was put into the wound to find the bullet or shell or fragment, or whatever was in there. One of the greatest troubles we have with the laity is to keep them quiet under thes circumstances; they will ask, "Have you probed for the bullet? Can you find it?" In the war with Spain the wound was simply dressed with a sterilized pad of gauze, or borated gauze, no other dressing put on, and this was retained and rest formed the balance of the treatment. In those cases no doubt the statistics would be much better.

Nature does wonderful things to some of those wounds. I wish to recite a case in point:

A young lady refused her lover any further attention, in consequence of which he became desperate, and as he left the house he drew from his pocket a revolver and shot her in the right side. The ball entered about the location of the eighth or ninth rib, and we did not know where it went at the time. She was considerably shocked, but somewhat recovered from the shock. The wound was treated conservatively; no dirty or clean fingers were introduced, no dirty or clean probe was introduced; supporting treatment was given, but finally she died. It was a medicolegal case and a postmortem was made. It was found that the bullet penetrated the lower part of the pleural cavity, passed through the liver, and we found it away down in the iliac region. It had passed through no important organ but the liver. Nature came near saving that case; a layer of tent-like construction was built over the wound in the liver, which served to keep the bile from getting into the abdominal cavity, and on the other side also a tent-like construction had been built over the bullet, which prevented further leakage. In the light of what we found I think that expectant treatment was advisable in this case, for while it did not save her life, after all we did not add anything to her death by attempted exploratory incision.

A member: I believe that a very important part of Dr. Clark's conservative treatment was keeping the patients from food, just as in the treatment of appendicitis this is, if not *the* most important point, at least an extremely important one. If in wounds of the abdomen the stomach is kept empty, thus stopping peristalsis, nature will certainly do wonders.

Dr. E. E. Munger, Spencer, Iowa: It is to be regretted there are no statistics dealing with the injuries which occur in the practices of country physicians. The hospital physician publishes his mortality list, based on a certain number of selected cases. In country practice practically no record is kept of cases, and of the many, many injuries that are treated conservatively we have no means of knowing what the mortality under conservative treatment has been.

In this connection I want to report a case which occurred a year ago the 31st of October. A husband went to serve on the jury. His wife went to the field to plow, using a gang-plow. As she rode around on the plow, in the afternoon she met a neighbor who was picking up corn in an adjoining field and throwing it on a wagon. As she passed he said to her: "You had better get off that plow and go home, it is a treacherous thing." But she continued to plow, and on the next round the plow struck a stone and she was thrown off. When the man reached the other end of the field he went home. At night he looked over to her house, and, seeing no light, he thought something must have happened to the woman. He went to her house, knocked at the door and had no response. Remembering where he left her and what he had said to her, he started to look for her, going where he had last seen her. He found where the plow had struck the stone, and he traced it to the barn yard. When the woman was thrown from the seat her leg had caught in the frame of the plow and she had been dragged along a distance of a mile, through a long pond of water; she was drenched, clothing torn and stripped from her body, the thigh broken in two places, and as the thigh was broken her body passed under the main wheel of the plow and the coulter passed above her body just at the 11th and 12th ribs. The marks of the two wheels were very plain. Almost every inch of her body was bruised and contused. When the horses reached the barn yard, as they went back and forth these two plows dipped into the manure and filth, which was wedged in until she was entirely buried, resting upon the two plowshares. A dog had accompanied her, and he occasionally went to her face and scratched the manure away from her body. She laid there from 4 in the afternoon until 9 at night.

She was taken into the house and two physicians called. We spent some 24 hours in overcoming shock before attempting to do anything to the thigh. Swelling was confined to the epigastric region. She vomited blood. Her temperature was 95 for more than 24 hours, and we could not count the pulse. We suspected rupture of the pancreas, but her condition was such we could do nothing. After about 36 hours she began to rally from the shock. As Dr. Clark and one gentleman discussing the paper suggest, she had no nourishment at any time except rectal enemata of whisky, sometimes salt solution, this being continued for 5 or 6 days. For this period she passed blood in large quantities. The swelling, tenderness and marked tympany over the epigastrium continued for some time. After 2 or 3 days we applied a Buck's extension, and, to make a long story short, she made an uneventful recovery. After the fifth day she developed double pneumonia, due to exposure. What the nature of the internal injury was we do not know, and we do not care, but it was serious. It is, however, absolutely certain that in that little hut, with no facilities except a cook stove, the surroundings unfavorable, had any attempt been made to render her any assistance by means of abdominal section, the additional shock from trauma would have resulted in death.

Dr. J. H. Rothwell, Liberty, Mo.: I want to report a case illustrating the point under discussion.

A young man was shot in the right side; the bullet passed through the liver, evidently passed through the stomach, through the colon and left hip, and came out under the skin over the left hip. He vomited blood immediately, within an hour passed quantities of blood from the bowel and also from the bladder. I dressed the wound antiseptically. In 36 hours he had no bad symptoms; in fact, he felt about as well as at any time. Then it became evident that there was very severe internal hemorrhage. The abdomen was opened, and in hunting for the point of hemorrhage it was found to be underneath the spleen somewhere, but the exact

point could not be found, and the young man was sinking so rapidly that the abdomen was packed with gauze under the spleen until the hemorrhage was stopped. This was done in the night, and I told the nurse to let us know when the boy died, as we wanted to hold a post-mortem and find how many holes there were through the intestines, stomach, kidney, etc. The next morning we received word that the young man felt much better. So the packing was removed and the wound dressed, and I never did find a hole anywhere. In three weeks the young man was well and could go where he pleased.

Dr. C. A. Lester, Wabasha, Minn.: I would like to ask the essayist two questions: Does the size of the bullet wound make any difference in our treatment? I remember that the bore of the musket my father carried in the Civil War was about ½ inch across.

The second question is, whether the length of time that has elapsed from the receipt of the injury to the time the doctor sees the patient has any effect upon the condition of the patient; that is, would movement during this interval, and the possibility of this movement causing leakage into the peritoneal cavity, have any effect upon his condition?

Dr. L. D. Peck, Hastings, Minn.: I believe that none but a competent surgeon should attempt abdominal incision or exploration; but if ever I was shot through the abdomen I should want to be taken to a competent surgeon as soon as possible and have him examine the case.

Dr. E. M. McDonald, Beaver Dam, Wis.: While I believe very much in conservative surgery, I cannot help thinking that conservatism means that Dr. Clark shall open into the abdomen and see what is the trouble. If the question were put to me personally I think I should want the abdomen opened, and if serious injury had not been done I should feel certain that Dr. Clark would not seriously endanger my life by exploratory operation.

However, I will say in support of the doctor's theory that the only gunshot wound of the abdomen I have ever treated was treated expectantly; I could not have done otherwise. A young man in going over the fence discharged his shotgun, and the shot went into the right groin so far that I could see an inch under the skin something protruding, and with the forceps I pulled out a piece of overalls. That was all that was done except to keep the external wound clean, and the young man to my surprise made a complete recovery. Six weeks afterward he came into my office stating that he thought something was the matter with the wound. I saw something that I thought looked like a foreign substance, pulled it out with the forceps and found that it was a piece of an old yellow almanac, which had been there all this time.

Dr. S. A. Stillman, Chicago: I would like to ask Dr. Clark if in his conservative treatment of bullet wounds in the abdomen, there is still time after he has waited for Nature to perform the cure, to operate and save the patient, and what would be the indications for an operation after this waiting? It seems to me that if I had a wound of this character I would, as stated here, want to get a competent surgeon and have an exploratory operation first; I would want to know if the intestine was perforated so that fecal matter could escape into the abdominal cavity. I would not want to die of septic peritonitis while expectant treatment was being carried out to see whether I would get well or not.

Dr. Clark (closing): I think perhaps some of the gentlemen did not quite understand what I was criticising when I referred to the general tendency of the average practitioner to in all cases open the abdomen in search of possible lesions. I do a little abdominal work myself, and I can conceive of a case in which I should feel justified in making an exploratory laparotomy, but in cases of gunshot wounds such as I have reported here I would not, and I think, so far as I have been able to learn from the statistics, I am not justified in doing it. I see that in the Russo-Japanese war *100 per cent* of the exploratory operations proved fatal, while quite a per cent of the cases not operated on recovered.

In regard to the size of the bullet, I think perhaps a wound made by a small bullet will

plug up more easily with mucous membrane than one made by a large bullet, whereas the large bullet might not let it heal at all, and allow escape of the contents of the bowels into the abdominal cavity; but I do not think I would be justified in cleaning out the peritoneal cavity, because as a general thing they die.

Of course, a patient ought not to be moved at all. The few cases I have treated were not moved. The boy who was wounded was placed on a cot and was kept absolutely quiet; we did not allow him to move hand or foot. The same thing was done in the other cases. Of course, if the patient is carried any distance, an injury of that kind will prove fatal. In the case of the young man shot through the bowels, a ride of half a mile or even ten rods I think would have killed him; his recovery depended upon the fact that he was not moved at all. There is no treatment except to keep the patient quiet and prevent anything being done.

As to thorough drainage, I do not know how to answer that question. Each case is an individual one in this respect. In the case reported there was considerable discharge from the posterior wound. I put a little gauze in there, which kept it open for 14 or 15 days, when the gauze was removed and the wound closed. There was a considerable discharge from it from day to day.

CAUSES AND TREATMENT OF NON-UNION IN FRACTURES.*

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(Under this heading it is also intended to include fibrous and ligamentous union and delayed union.)

Classifying the causes according to their importance I would mention:

(1) Faulty apposition. This is due many times to the obliquity of the fracture and the resulting difficulty in holding it in position, in cases of comminuted fracture and where there is interposition of soft tissues, such as muscle, fascia and blood clot or fragment of bone.

(2) Imperfect immobilization or too early mobilization, overriding and separation of the fragments.

(3) Constitutional disturbances. The more important ones under this heading are syphilis —diabetes or traumatic glycosuria—and anemia, general and local. All of these conditions interfere with the production of plastic material and lead to slow ossification of the callus.

The first requisite to secure perfect apposition in recent fractures is the use of the x-ray, which should be done in all cases. In certain oblique and comminuted fractures, where it is impossible even with the aid of the x-ray to secure perfect apposition or immobilization, it is advisable to cut down upon the fracture and wire the ends together.

There are several fractures where it is advisable to cut down upon at once and wire, viz., where we have a combined fracture of the radius and ulna, or if the tibia and fibula, in fractured patella and in a double fracture of any long bone, or where there is marked displacement, making reduction and immobilization difficult, also in cases where there is considerable laceration of muscle and fascia, for in the latter cases we almost invariably get delayed union, owing to the interposition of soft tissue, early operation and wiring removes this with a considerable saving of time and annoyance. I mention wire for the reason that I use it in preference to any other form of bone suturing. Some surgeons strongly advocate the use of chromicized catgut, claiming the wire acts as an irritant, but in my opinion catgut is too quickly absorbed and does not approximate the fracture as does wire. I have used the medium silver wire in a great many cases, some of six years' standing, and have never had any trouble in any instance.

Should it be a case of several months' standing with no union, or very slight union, open down upon the fracture, remove all atrophied or spongy bone, strip back the periosteum but

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save it and bring the bones together, pass your wire through and through, and after tightening it, cut the ends as short as possible and bury the ends, suturing the periosteum over all. I find this extra precaution is worth while, for it is when the wire is left exposed that it acts as an irritant. After completing the operation direct your attention to the general health.

We too often neglect this part in the treatment of fracture. Owing to the great number of foreigners among the laboring class, it is impossible to get a family history so I have lately been giving potassium iodid in all cases and push it quite vigorously. Should the case not require it, no harm is done. I have had 3 cases of non-union as the result of syphilis and in one case was obliged to amputate, in which I believe the early use of potassium would have saved the limb.

Anemia as a rule is not given much thought until our attention is attracted to the patient's general appearance, which may not be noticed until some time after injury. This condition should be investigated early. Wright's stain for blood count is a simple and reliable procedure, taking but a few minutes, and if found to be abnormal, appropriate treatment should be instituted at once.

There is little stress put upon the examination of urine in cases of fracture, but it should be done in every case, for frequently the cause of delayed union will be found here, either as a pre-existing diabetes or as a traumatic glycosuria. In 12 consecutive cases of fracture, examination of urine 12 to 24 hours after accident revealed sugar in 2; 1 in fractured tibia and fibula and 1 in fractured pelvis. Delayed union resulted in the former case. Halstead reports 40 cases of fracture with sugar in 10.

It is common to find sugar in urine following head and spinal injuries, but it should be sought for in all cases, and if found should be combated by restricting the diet, for it interferes with the healing of fractures, and if it complicates a compound fracture, operation should be delayed until the elimination of sugar is under control. When infection is present there is an immediate increase in the sugar and strict attention should be given the wound. Free incision and drainage under local anesthesia should be performed at once. If amputation is imperative, do so under local anesthesia or spinal cocainization, as it insures the least risk to the patient.

In many cases the amount of reparative tissue thrown out is inconsiderable and we have a local anemia with delayed union to contend with. In such cases the Bier method is invaluable. In fractures below the elbow the method as pursued by me is as follows:

Apply a silk elastic bandage above the elbow sufficiently tight to retard venous circulation and to cause the hand and forearm to swell slightly, but not to cause pain. This is left on for 24 hours, then removed. The splint is also removed and the seat of fracture is lightly massaged for 10 or 15 minutes; the elastic bandage is then left off for 6 hours and reapplied for 24 hours. This is continued until consolidation begins or is found to be doing no good. In fractures below the knee the same procedure is followed with the bandage applied above the knee. In 3 cases tried it accomplished results in 6 weeks.

At times it is advisable to stimulate the new formation of bone by drilling into the ends of the fracture or rubbing the ends forcibly together. This is a valuable adjunct to the Bier treatment.

In closing I would emphasize the necessity of a rigid external dressing, sufficient also to immobilize the two adjacent joints.

IRRITATION.

As it is the foundation of surgical science you must carefully investigate, and clearly understand before you can expect to be masters of the principles of your profession, or be able to practice it with credit to yourselves, or with advantage to those who may place themselves under your care.—Sir Astley Cooper.

The occurrence of *cholecystitis* as a sequel of general infection of the excretory apparatus of the liver is like chronic salpingitis, persisting after the acute septic endometritis which established it has subsided.—*Bland-Sutton.*

COLLES' FRACTURE.*

BY W. O. BROWN, M. D., STRATFORD, TEXAS.

Colles' fracture is one of great importance to the surgeon, first, because of its frequency and, second, because of its difficulty to reduce. If we fail to reduce it, it stands as a prominent monument to our weakness as a surgeon. We well remember seeing a number of old Colles' fractures when we first began the practice of medicine. In almost every instance the person who bore this "silver fork" deformity would say that he had a doctor who did not know how to "set it." Sometimes the bearer of this deformity would say that "the doctor did not know how to set it and he was a good doctor, too." With our modern light on the treatment of Colles' fracture no surgeon need have it said of him, "the doctor failed to set it right."

This fracture is usually produced by a fall upon the palm of the outsretched hand. The line of fracture is from ¾-1 inch above the articular surface. It is usually transverse, but may be oblique in either direction. There is a backward displacement of the lower fragment; the styloid process is displaced upward by crushing; the articular surface looks down and back instead of down and forward. Aside from the characteristic backward deformity there may be a latteral displacement to the radial side; also be a marked depression in front of the ulna. In a few cases there may be only a slight variation from the normal relations of the bone.

As to differential diagnosis we must consider sprains of the wrist, fracture of one or both bones just above the wrist, dislocation of the wrist backwards.

Treatment.—Great advancements have been made within the last few years in the treatment. A few years ago there was an impression that a great per cent of these fractures were unreduceable; in fact, a great many surgeons would make but a feeble effort to reduce them. One of the greatest surgeons and authors in America has this "silver fork" deformity which he sustained more than 20 years ago.

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

he sustained more than 20 years ago.

The first step in the treatment is to administer an anesthetic. This being done, grasp the arm firmly above the fracture with one hand and thumb. The other hand should grasp the hand of the patient and flex it toward the ulnar side as much as it will bear. At the same time maintain traction and by manipulating with the two thumbs force the fractured bone into place. This flexion of the wrist toward the ulnar side relaxes the upward tension on the fractured bone, and makes it possible for the surgeon to force it into place. Sometimes a great deal of force is required to overcome the resistance.

If, however, we should fail to reduce the fracture by this method, we must then grasp the arm above the wrist with both hands. The thumb should be on posterior aspect of arm and pointing toward the fracture. The fingers of the surgeon's hand should rest on the anterior aspect of the injured limb. The hand of the patient should then be bent forward at same time the thumbs should force the fracture into place while the fingers make counter pressure on opposite side of upper fragment. Also, the hand of the patient may be grasped by one hand of the surgeon and the arm grasped just above the fracture; then forcibly flex the wrist backward, breaking up any adhesions that might exist; then with the thumbs and fingers force the fracture into position. After the fracture is reduced the arm should be relaxed to see if the deformity will return of its own accord. If it does we take note of it so we can apply our pads to prevent it. Whether we use splints or plaster dressing great care must be exercised to prevent the recurrence of the deformity while dressing is being applied. The splint dressing with the hand flexed toward the ulna is the best dressing. This is the pistol splint, and the splints should be shaped to correspond with the flexion of the wrist.

After the dressing is properly applied the arm should be placed in a sling with the radius directly over the ulna.

Females suffer more than males from *irreducible hernia,* chiefly owing to their being more commonly afflicted with femoral hernia.—*Eccles.*

The X-Rays in Theory and Practice.

THE DIAGNOSTIC VALUE OF THE X-RAY.

J. M. MARTIN, M. D., DALLAS, TEXAS,

Professor of Electro-Therapeutics, Medical Department of Baylor University and Texas State Dental College; Member of Dallas County Medical Society, Central Texas District Medical Society, North Texas District Medical Association, Texas State Medical Association, American Medical Association and American Roentgen Ray Society, etc.

The x-ray has passed through the evolutionary stage and has settled down to a recognized and well-earned position in both medicine and surgery. It is probably of greater value to the surgeon than the general practitioner.

Fig. 1.

Fracture of Humerus with Displacement. (Taken with Portable Coil.)

Fig. 2.

Fracture of Upper End of Ulna. (Taken with Portable Coil.)

After an experience of several years, during which time we have made hundreds of skiagraphs representing all kinds of fractures and dislocations—taken before and after reduction or attempted reduction—we have come to the conclusion that it is next to criminal not to use or recommend the use of the x-ray in all bone injuries where there is the least doubt as to the existing condition.

We have skiagraphed recent fractures a number of times where reduction had been as often attempted, showing that the fracture had never been reduced.

I recall the case of a fractured femur in a child 9 years old. The first skiagraph was made six weeks after the injury. The bones were lapping about an inch. Reduction was again attempted and a plaster-of-paris cast placed on the leg. In about ten days a skiagraph taken through the cast showed the bones still lapping as before. After fastening the bones together with a silver plate results were excellent. Without this means of diagnosis this boy would have had a short leg, which if skiagraphed in after life, would have called down discredit on the surgeon responsible for same.

The early and proper use of the fluoroscope

and skiagraph in all bone injuries will not only protect the patient against deformity, but will save the physician much anxiety and the

Fig. 3.
Bullet Lodged in Chest. (Taken with Portable Coil.)

possibility of damage suits. If skiagraphs of difficult bone injuries were always made before and after reduction and at intervals during the process of repair, besides being of the greatest practical and scientific importance in case reports, they would be evidence of sufficient strength in most cases to prevent a damage suit by designing parties or to defeat one if begun.

On account of atmospheric influences mainly, the static machine is no longer considered a factor in modern skiagraphic work. It is true

that very good skiagraphs can often be made of the extremities and sometimes of the deeper parts when the static machine is used as the source of energy; and where no other apparatus is at hand I would not discourage its use, but even the best static machines are so very inferior to the modern x-ray coil that there is no longer any comparison between them.

In general practice even in the larger cities the physician is beset with many difficulties in

Fig. 4.
Portable Coil, Ready for Use.

getting an x-ray diagnosis. The modern coils, though much smaller than the static machines, are often times heavier and on account of the interrupter and other necessary apparatus can not be easily carried to the bedside of the patient.

While a great many patients can be brought to the x-ray laboratory for examinations a large majority can not be carried about for that purpose. The physician and surgeon feels the need of a reliable portable coil that will answer all of the requirements for a passable skiagraph of any portion of the body; a coil that can be easily placed in a buggy or taken on the street car and operated on any current, battery, dynamo, alternating or direct. I am aware that this is asking a good deal and for a time a combination I thought impossible.

I am now operating three coils, a 12, 16 and 24 inch. The 12-inch coil was for a time used for outside work and was moved from place to place as needed. To do this it was always necessary to get a float or moving wagon and in many cases it was necessary to do special wiring in the residence, all of which required so much time that it was not considered practical.

Some time ago Mr. C. O. Olson, late president of the Western X-Ray and Coil Company, and now president of the Chicago X-Ray Coil Company, brought to my notice a coil they are manufacturing which is truly a portable coil in every sense of the word.

This coil is no larger than an average suit case, can be carried like a grip and is built to be operated on any current. It is small and compact, the case contains all of the accessories, except the tube and fluoroscope. A light fiber case can be had for these articles so that they can be carried about as needed.

Fig. No. 4 illustrates the coil in action. This coil can be carried into the patient's room opened up and put to work in about 5 minutes. The coil is so small that it can be placed on the bed beside the patient while making a skiagraph, or a fluoroscopic examination. With a coil of this kind, which is within the reach of every physician and surgeon, there is no longer an excuse for not being prepared to make an x-ray examination of all injuries where it is possible to get either the alternating or direct current.

There are two phenomena of tumor growth closely allied to one another, which may be included under the heading of "Transformation of Innocent Into Malignant Tumors."

1. Instances where a tumor, after retaining for many years the characters of an innocent growth, has changed its character and become malignant.

2. Instances where a number of tumors of the same type of structure are present in a patient, some being innocent, and one or more malignant in character. Those which are malignant may have been originally innocent or they may have been malignant from the first; but the history is often wanting which would enable us to judge between these two possibilities.—*Cathcart.*

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ANNUAL MEETING.

The fifth annual meeting of the American Association of Railway Surgeons will be held in Chicago October 14, 15 and 16, 1908.

APPOINTMENT OF DR. PIERCE.

Dr. F. E. Pierce, of Chicago, instructor in surgery, Northwestern University Medical School and assistant surgeon to Mercy Hospital, has been appointed chief surgeon of the Lake Shore and Michigan Southern Railway Company, including the Lake Erie, Alliance and Wheeling and the Dunkirk, Allegheny Valley and Pittsburgh Railroads.

The doctor's headquarters will be in the La Salle Street Station.

THE PUBLIC'S RESPONSIBILITY FOR RAILWAY ACCIDENTS.

This is the title of a recent article* by Mr. Julius Kruttschnitt, who, as is generally known, is director of maintenance and operation of the Union and Southern Pacific Railways.

He first points out one hopeful fact, that on the Union Pacific, not only the percentage, but the absolute number of accidents has been reduced. In 1906 the number killed was 114, in 1907 it was 105. The number of injured was reduced from 1,983 in 1906 to 1,104 in 1907. Yet during this time the number of passengers carried increased by 12.87 per cent.

The author next shows that a large part of the accidents tabulated by the Interstate Commerce Commission are not directly chargeable to railroading properly so-called. For example, accidents in the shops, handling freight, etc. Coming now to those due to train movement, 5,381 of the 9,051 deaths were of trespassers, a number greater than those of passengers and employes together. This great waste of life, writes the author, was due to no fault of the railroads. It was chargeable wholly to willful carelessness on the part of those injured.

Mr. Kruttschnitt believes if we were to sum up the causes for the vast cost of life on our railways, an immense heedlessness would come first—which seems to be due to our national

*Appleton's Magazine, July, 1908.

temperament. A desire to do something which is forbidden, because it is forbidden accounts for not a few casualties, while sheer ignorance accounts for others.

As regards remedies, the accidents from jumping off or on moving trains or from walking on the right of way, are almost beyond direct remedy. Possibly legislation may do something by rendering trespassing difficult or impossible, and providing penalties for failure to make use of safety devices.

Regarding the good faith of the railways in endeavoring to lessen the number of casualties, the author alludes to the accident bulletins gotten out by his companies. These are issued for publication and make special mention of the principal accidents with an account of their causes. He also refers to the courses of instruction of employees upon the theory and practice of safety in railroading, by means of traveling outfits of charts, working models and photographs with a competent corps of instructors.

"The instruction thus offered is checked by frequent and regular examinations which are supplemented by almost continuous tests. These in particular appeal to the public because they are intended to reproduce artificially and without warning conditions likely to result in accident. From June, 1904, to the end of 1907 no fewer than 43,104 tests were held on the Union Pacific System. Of all these, 99.1 per cent were promptly and correctly observed, and every failure was followed by proper discipline, action in each case being publicly posted on bulletin boards, *although in no case of failure did any accident happen.*

"The record for December, 98.9 per cent of efficiency, was not discreditable, and yet, nearly four years earlier, and within a few months after inaugurating the system of tests, the percentage frequently rose to over 99. One lesson from this is plain. We can not afford to relax our efforts for a day: Eternal vigilance is the price of safety. Yet our constant vigilance has not availed to raise the standard.

"The cause," according to the author, "lies in the fact, which can not be denied, that the efficiency of railroad employees has deteriorated in the past few years. And this deterioration can not be compensated. A railroad is much more dependent upon its human than upon its material equipment for safe and efficient operation. No matter how generously every material equipment is provided, how lavishly capital is expended for improvement of roadbed, additional side tracks, terminals, safety devices, and the like, the outlay is useless unless the road is efficiently manned. It is therefore altogether regrettable that the attitude for our employees has been changed. That it has been changed from loyalty and consideration to indifference if not to disloyalty, no observer will deny. And the influence which has brought about this change is unquestionably the present state of public opinion which condemns all corporations indiscriminately."

Mr. Kruttschnitt concludes as follows:

"The army of railroad employees is in a demoralized condition, and as results show, is inefficient in safeguarding life and property entrusted to it. What is the remedy? Simply that if our employees once realize that the responsibility for the discredit now resting on the operation of American railroads is not one that can be placed entirely on their officers, but that they themselves must assume a large part of it, joint effort and cordial coöperation to remove the load of joint discredit must necessarily follow.

"And how is this realization of responsibility to be brought home to the employees? By the help of the public; by the force of their opinion. It must discriminate between the bad and the good in passing judgment on corporations and their officers. . . . The unnatural and hostile conditions that have resulted from the attitude of the press and the public toward public corporations must be replaced by peace and coöperation; and while not abating its condemnation of abuses or relaxing its determination to correct them, it must in the exercise of its determination give the support of its all-powerful opinion to the earnest efforts of railroads to improve discipline, increase safety, and generally raise the standard of service."

The *family history* is but rarely of any real importance in diagnosis. A few diseases, however, show a marked tendency to be transmitted from one generation to another, and a history of such a disease in a near relation may occasionally throw some light upon the problem of diagnosis. Perhaps the best examples of hereditary transmission of disease are afforded by hemophilia and colorblindness. In the diagnosis of the former, family history is often of much importance.—*Berry.*

Translations

THE ESTHETIC TREATMENT OF FRACTURES OF THE CLAVICLE.

R. MILLON, M. D., PARIS, FRANCE.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

Fracture of the clavicle at its usual site (through the body of the bone) always produces considerable displacement. The outer fragment is pulled down by the weight of the arm and the deltoid; to the inner side by the pectorals and the subclavius which are inserted into the bone; the inner fragment is carried up and slightly forward by the sterno-mastoid. By simple inspection we see the inner and upper fragment impinge on the skin; by seizing the fragment between two fingers we obtain abnormal mobility; the distance between the acromion and the sternum is lessened. In short, from the beginning, the lesion is visible to the naked eye, and no matter what treatment is adopted, this deformity does not become any less visible. The formation of the callus marks the site of fracture by a large, projecting mass, so the patient carries the evidence of this fracture with him the rest of his life. While this deformity is of slight moment in the masculine subject, it becomes of much importance in female patients, especially those of the upper classes, in whom the exigencies of fashion demand the wearing of décolleté costumes.

For this reason, especially of late years, when the craze for automobiling has multiplied traumatisms in well-to-do people, an effort has been made to remedy this exuberant callus formation and over-riding of the fragments. Up to the present time, however, of all the various methods of treatment adopted, but one has given appreciable results.

Whether we make use of Hennequin's apparatus or that of LeDentu, of the suspenders of Lannelongue, of the axillary bracelets of Guillemin or of Forgue, all apparatuses, the object of which is to depress the upper fragment, the results are never advantageous from the present point of view. While consolidation soon occurs, it is always obtained at the expense of a considerable amount of callus, which is only too apparent, and the progress is no greater than was made with the old-time slings of Mayor and Petit which immobilized the fragments just as well.

As to massage in this location, it is more injurious than useful, it favors hypertrophy of the callus, and should only be employed after the lapse of some time, when the callus is already solid and with a view to remedy the contusion of the shoulder and the ankylosis which is not slow in appearing.

Efforts have been made to remedy the difficulty by substituting immovable apparatuses for those of linen or flannel. For fracture of the outer third, those outside of the coraco-clavicular ligaments, Hennequin succeeded by a silicate of soda cast in lifting up the base of the shoulder when there is displacement of the fragments (very rarely the case); to this collar cords of india rubber were attached, passed to a similar collar of silicate of soda passing around the forearm, so the arm was kept constantly elevated. This device would not answer for fractures in the middle third. In this location reduction of the displacement is not difficult, it can be easily accomplished by lifting the base of the shoulder up and back, by exaggerating this movement, the outer fragment can be brought into contact with the inner elevated fragment without any difficulty. The trouble lies in maintaining the fragments in position and we can see that a plaster cast, no matter how skilfully it is applied, can not keep the mobile fragments in place. It has been attempted, however, and it would seem that by padding the axillæ, bringing the shoulders together behind by a figure-of-eight bandage crossing over the back, then rapidly applying a bandage of quick-setting plaster of paris, which covers in the cotton bandage, passing at the same time under the line of fracture to depress its inner fragment, we can obtain better results than by simple bandaging. But how painful is such a cast and how uncertain is the regular coaptation of the fragments.

In view of all these difficulties a naval surgeon, M. Couteaud, conceived the happy idea

of letting Nature accomplish what could not be obtained from the most perfect bandages. He came to the conclusion that the best agent to keep up and outward the base of the shoulder with an exasperating tendency to slip down and in, was the weight of the limb, so he put this idea into practice by placing the patient in a certain position without any apparatus whatever.

It was found that with the patient lying flat on his back, if the arm was left to hang down the height of the bed without support, the simple weight of the arm overcame the action of the pectoral muscles and those of the shoulder, and once this action was overcome, the weight alone carried the lower fragment up, hence the latter came naturally into contact with the upper fragment slightly hyperelevated by the action of the sterno-mastoid. This is what really happens. Suppose we have a fracture of the left clavicle: the man (or more often the woman) is placed on the left side of the bed, the head resting on a bolster fastened to the head board, the injured shoulder is placed so the arm hangs down vertically. At first the muscles about the joint keep up contraction so we must wait two or three days for the arm to become limber, not till this time will the result desired be attained.

We may then relieve the patient by letting the forearm flexed at a right angle rest, supported by a cushion, on a stool. As may easily be seen this relief is only to be afforded when the arm hangs down actively and freely by its weight alone, there is another advantage from this support and that is, it brings about a closer juxtaposition of the fragments. We then see all deformity in the course of the bone disappear, and by palpation we feel the two fragments are absolutely in a straight line.

It takes about three weeks for the callus to become firm. At this time we may shift the arm and begin massage.

Such is a genuine esthetic treatment. Coutead gives the details of six cases which he treated, perfect results were obtained in all. The two clavicles were found by a compass to be of exactly the same length, the x-ray proved the absence of all over-riding, there was no swelling visible.

The advantages of the method are manifest. It is well to add that its application is remarkably easy, and its technic so simple the first comer may apply it. On the other hand, the inconveniences are very slight, to be sure it necessitates a prolonged stay in bed, it has not been customary to keep patients with fracture of the clavicle in bed for three weeks. The dependent position of the arm is painful, at least for the first few days. Lastly, this position leads to edema of the hand, which may take a long time to disappear. This treatment, it must be understood, is an exceptional one. It will not be necessary to apply it, save in a somewhat small number of cases, and under conditions where the inconveniences of the treatment appear slight in comparison to the results attained. It is likely the time may be shortened, we know how many fractures of the clavicle are speedily consolidated. Couteaud believes possibly two weeks' time may be sufficient to bring about a strong enough consolidation so the extension may be dispensed with and the arm brought back to its normal position.—*Revue Internationale de Medecine et de Chirurgie.*

EMBOLISM OF THE PULMONARY ARTERIES THREE MONTHS AFTER FRACTURE OF THE PATELLA.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

Strauss shows that sudden death following on fractures is not altogether exceptional; it usually follows fat embolism of the brain or lungs and appears some hours or even days after the accident. Embolism of the pulmonary arteries arising from venous thrombi in the vicinity of the site of fracture is much rarer, if we are to judge from the number of cases published. Some forty-four cases are to be found in the literature, among them thirty-nine cases of sudden death, ensuing some weeks or months after the accident. These figures, however, are far from expressing the real frequency of venous emboli, which may make their appearance with slight symptoms and be easily overlooked. This

was the case in the one reported by Strauss, but which ended suddenly and fatally.

It concerned a man of 49, who on February 1, sustained a fracture of the patella while at work. He was treated by a physician until the middle of March, and on April 15 was admitted to the surgical clinic at Greifswald. He still felt pain in the limb while standing and walking; flexion was much limited, but there was sufficient extension; there was a space of two finger breadths between the fragments, and the quadriceps was somewhat atrophied.

No operation was undertaken, but massage and gymnastic exercises were instituted. Walking soon became easier, when on April 18 the patient, otherwise well, complained of pricking sensations under the right scapula, the temperature rose to 100.6, and signs of dry pleurisy made their appearance in the painful area. By the end of the third day all these had disappeared, the mechanical treatment was suspended. Five days later, the pricking sensations reappeared under the right scapula, the temperature again rose. After stethoscopic examination a diagnosis of central pneumonia was made, reddish expectoration appeared; then a moderately abundant pleural exudate; exploratory puncture withdrew a sterile, serosanguineous fluid. May 5 the patient who was slowly becoming convalescent became suddenly collapsed and cyanosed, dying without any apparent change in the pulmonary condition; myocarditis was suspected. At the necropsy a superficial infarct was found in the lower lobe of the right lung and embolism of both pulmonary arteries. The latter originated in thrombosis of the femoral vein extending from the popliteal space to the iliac vein; the clot filled the lumen of the vein completely, it was deep red, but slightly adherent, and was prolonged into the small veins in the vicinity of the knee, the superficial veins remaining permeable.

According to Strauss the following is the probable explanation of the state of affairs: The thrombosis of the veins in the neighborhood of the focus of fracture had extended to the femoral, and the transient phenomena preceding the fatal crisis were due to minute emboli; later on larger clots obliterated the pulmonary arteries. Hence the death, though delayed, can be attributed to the initial trauma, the industrial accident. Strauss calls especial to the delay in the appearance of the emboli, the first symptoms were on the seventy-third day, the last two on the ninety-third and ninety-fifth days respectively. This is interesting, since in all the cases recorded hitherto, the symptoms appeared from the thirteenth to fortieth days. In Strauss' case, moreover, there were scarcely any signs of phlebitis, the only thing noticeable was slight swelling of the limb, which was supposed to be due to the prolonged stay in bed, and which soon disappeared after massage. It may be asked whether the massage and the mobilization had not something to do with the untoward result. In conclusion, embolism should always be suspected when obscure pulmonary symptoms, no matter how slight, make their appearance, after a trauma. —*Semaine Médicale.*

Miscellany.

PHILADELPHIA ACADEMY OF SURGERY.

THE SAMUEL D. GROSS PRIZE FIFTEEN HUNDRED DOLLARS.

Essays will be received in competition for the prize until January 1, 1910.

The conditions annexed by the testator are that the prize "Shall be awarded every five years to the writer of the best original essay, not exceeding 150 printed pages, octavo, in length, illustrative of some subject in Surgical Pathology or Surgical Practice, founded upon original investigations, the candidates for the prize to be American citizens."

It is expressly stipulated that the competitor who receives the prize, shall publish his essay in book form, and that he shall deposit one copy of the work in the Samuel D. Gross Library of the Philadelphia Academy of Surgery, and that on the title page, it shall be stated that to the essay was awarded the Samuel D. Gross Prize of the Philadelphia Academy of Surgery.

The essays, which must be written by a

single author in the English language, should be sent to the "Trustees of the Samuel D. Gross Prize of the Philadelphia Academy of Surgery, care of the College of Physicians, 219 South Thirteenth street, Philadelphia," on or before January 1, 1910.

Each essay must be typewritten, distinguished by a motto, and accompanied by a sealed envelope bearing the same motto, containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay.

The committee will return the unsuccessful essays if reclaimed by their respective writers, or their agents, within one year.

The committee reserves the right to make no award if the essays submitted are not considered worthy of the prize.

WILLIAM J. TAYLOR, M. D.,
RICHARD H. HARTE, M. D.,
DEFOREST WILLARD, M. D.,
Trustees.

Philadelphia, June 15, 1908.

BULLET WOUNDS OF NERVES AND THEIR PLASTIC OPERATIONS.

N. Namba analyzes 439 nerve lesions occurring in some 6,663 cases of injuries to the extremities treated at the Nagoya (Japan) Army Hospital. The increased proportion of nerve injuries is explained as due to the increased velocity of projectiles and to the fact that many legs and arms are now saved, that, under old conditions, were amputated. The nerves of the forearm are those most often involved as a result of their more exposed position. Of the total cases treated, some by medical and some by surgical methods, 24 per cent were considered cured. The author states, however, that many of the cases cured were of a very mild nature. No rule of procedure could be laid down; the technic was decided upon as indicated in each case and included simple massage and baths, electricity, freeing from the pressure of surrounding tissues, resection, transplantation and implantation.—*Military Surgeon.*

Notices and Reviews.

"Adenomyoma of the Uterus. By Thomas S. Cullen, M. B., Associate Professor of Gynecology in Johns Hopkins University. Large octavo, 270 pages, with illustrations by Hermann Becker and August Horn. Philadelphia and London; W. B. Saunders Company; Chicago: W. T. Keener, Son & Co.; 1908. Cloth, $5.00 net; Half Morocco, $6.50 net.

Dr. Cullin's large clinical experience and material at his disposal in connection with his original work in gynecologic pathology especially equips him for this undertaking. A brief outline of the clinical history of each case is given at the beginning, and if carefully studied will materially aid in clearing the cause of uterine hemorrhage in many perplexing cases. Then follows a succinct description of the pathologic condition of the uterus. The illustrations clearly present the origin of the gland elements.

This work will be welcomed by all laboring in this field as a beacon light along a road formerly strewn with many stumbling places; shedding its rays on a pathologic condition which has been looked on until recently as of rare occurrence and seldom encountered on the operating table. The pioneers in this work have been Von Recklinghausen, Lockstaedt, Baldy and Cullen, who have shown that cases of supposed myoma of the uterus are in fact adenomyoma and where this viscus is found preserving a relative normal contour, the increase in size is due to changes of this character.

Cullen found 5.7 per cent in 1,283 cases examined. That he found this pathologic change in these growths 73 times would hardly be accepted were it not for the fact that the proof presented by him is so incontestable, and the evidence so positive, one cannot doubt the microscopic findings. The result of the author's investigation is convincing that many of us have been removing uteri thought to be myomatous when in reality they contained adenomyomatous growths.

The work is beautifully gotten up and a credit to the publishers. The drawings are accurate and of incalculable value to the student of uterine pathology. This work of Dr. Cullen

should be on the table of every earnest physician.

"ALRITE."

"A Text-Book of Surgical Anatomy." By William Francis Campbell, M. D., Professor of Anatomy at the Long Island College Hospital. Octavo, 675 pages, with 319 original illustrations. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co.; 1908. Cloth, $5.00 net; Half Morocco, $6.50 net.

It has been said that an educated man is one who knows what he wants and where to get it when he wants it, and how to use it when he gets it. This applies with peculiar force to medical education—and the surgeon who exemplifies this definition is equal to any emergency—and qualified for every demand that may be made upon him.

Some such idea undoubtedly inspired Dr. Campbell in the writing of his very able and practical book. He states in his preface: "No teacher can impart, or student assimilate, all the details of anatomy. The facts must be sifted, their comparative values fixed, and the reason for their acquisition demonstrated by directing attention to the practical problems with which they are associated.

A fact that can be utilized is a fact that will survive. No attempt, therefore, has been made to present all the anatomic data. Those facts only have been selected which have a practical bearing, and those structures and regions emphasized which have a peculiar interest for the surgeon. The single purpose of this book is to aid the student and practitioner in mastering the essentials of practical anatomy."

That this purpose, so clearly stated, has been fulfilled in the body of the work a study of the 675 pages clearly demonstrates.

The book is concise, lucid, practical, with many new illustrations—such a work, in fact, as a busy practitioner delights to find and one which will no doubt enjoy a lasting popularity.

JERE L. CROOK.

Practice of Medicine for Nurses. By George Howard Hoxie, M. D., Professor of Internal Medicine, University of Kansas. With a chapter on the Technic of Nursing, by Pearl L. Laptad, Principal of the Training School for Nurses, University of Kansas. 12mo, 248 pages, illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co., 1908. Cloth, $1.50 net.

This book is, as is announced in the title page, a text-book for nurses, as well as a handbook for all those who care for the sick. It presents in a concise form the essentials of the theories upon which the practice of medicine and nursing is based, as well as clearly-stated precepts for the practice of nursing. The mastery of these principles and theories makes of the nurse, not a mere automaton, but gives her a capable judgment in the handling of the varied situations and conditions as they arise.

The book is especially to be commended for the clearness of its statements. The sentences are short and to the point. The chapters on the "Cure of Disease and the Means for Determining Conditions" are most valuable, inasmuch as they lay the foundation in generalities for the principles and precepts which are given more in detail in the discussion of the special diseases.

The book contains much important information concerning the practice of medicine which all nurses should know. It does not deal with the theory and practice of nursing, but rather with the practice of medicine from a nurse's standpoint.

R. W. C.

A Manual of Diseases of Infants and Children. By John Ruhrah, M. D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Baltimore. Second revised edition. 12mo, 423 pages, fully illustrated. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co., 1908. Flexible leather. $2.00 net.

This little manual gives to the clinical student at a glance the main outlines of the subject under consideration. Definition, etiology, pathology, symptoms, diagnosis and treatment are discussed tersely. The arrangement is convenient, and the general practitioner will find here a handy means of readjusting his experiences to the newer teachings in pediatrics. For this use one might wish a more complete index. For example: Kernig's sign is concisely described and illustrated, but not indexed. It is not a good recommendation for the college in which the author or compiler teaches, that he uses the copyrighted names of U. S. P. articles in the place of the officinal designations; *e. g.*, "urethan," sulfonal," "trional" and "salol."

We find no mention of so common a condi-

tion as tuberculous affections of the joints, and in the diagnosis of tuberculosis the compiler omits reference to tuberculin injections and Calmette's test. The pages of biblography are of doubtful value, because admittedly very incomplete.

The chapters added on school inspection and contagious diseases suggest that public-school teachers might find the volume very useful in lieu of needed medical inspections, and it would have added to its value if the minimum period for exclusion from school after these diseases had been stated.

The author is to be commended for not attempting to discuss surgical procedures, though freely advising them. In the treatment of typhoid a milk diet is advised, though we all know that sweet milk is a most excellent culture medium for the typhoid bacillus.

A manual is to a text-book, what the sketch or key, is to the finished painting. In spite of criticisms, which may be removed in subsequent editions, students and practitioners will find this volume of daily value for suggestion.

HENRY B. HEMENWAY.

A Text-Book of Clinical Anatomy: For Students and Practitioners. By Daniel N. Eisendrath, A. B,. M. D. Second revised edition. Octavo, 535 pages, with 153 illustrations, a number in colors. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co., 1907. Cloth, $5.00 net; half Morocco, $6.50 net.

As stated in the preface, this book is intended as a bridge between the anatomy taught in the first and second years and the clinical work of the last two years of a medical course. It is more than this: It is a most admirable work for the surgeon who wishes to have his anatomy at his fingers' tips for special operations. The text is concise and verbiage excellent. It is a book that every railway surgeon should have on his desk for reference.

The illustrations are unique, being superimposed drawings on photographs of the human body.

W. H. BOHART.

"Hospital Training-School Methods and the Head Nurse." By Charlotte A. Aikens, late Director of Sibley Memorial Hospital, Washington, D. C.; Associate Editor of the National Hospital Record. 12 mo, 267 pages. Philadelphia and London: W. B. Saunders Company; Chicago: W. T. Keener, Son & Co. Cloth, $1.50 net.

Miss Aikens' suggestions of a Bible Class and Special Lecture Course, including questions of the day (Charities, Needy Families, Child-Saving Institutions, etc.) are excellent. Every pupil and head nurse would be the better nurse for having had these questions presented to them in an intelligent manner every year.

The Preparatory Period of instruction seems too full. This instruction could better be covered in the Junior year. If too much theory be given during the probationary period and the pupil is then not accepted, or leaves the school, she too often feels competent to take care of the sick without further instruction. The author's outlines for the Intermediate and Senior years are excellent.

The chapter on the Art of Teaching could not be improved. Every teacher should read this, and if applied, results would be marked. If the fundamental principles, as described by Miss Aikens, were fully carried out, all nurses would be well equipped for giving instruction. Dietetics, as all know, is one of the essential studies for the nurse, and the suggestions along this line of study, found in this book, are worthy of being copied.

Anatomy and Physiology can not be too thoroughly taught and suggestions will be appreciated by both the pupil and the teacher. The chapter on Practical Nursing should be well digested. It is the important part of the nurse's training. The outline here given helps to impress upon the mind the points to be emphasized.

The chapter on Observation of Symptoms, Miss Aiken tells us, was outlined by a physician. I do not think it practical for the pupil nurse. Some of the observations come within the nurse's province, but so many do not it seems almost superfluous.

Too much can not be said upon the subject of Materia Medica. I think the negative use of drugs, as suggested, is good (that is, teaching the nurse the harmful results, rather than the useful ones). Bacteriology and Surgical Technic are rightly classed together. As the book suggests, a nurse should understand why her technic should be thorough.

The other subjects, together with the specimen examination papers, complete the book. Altogether the work should be valuable to the

graduate nurse as well as to the teacher. With these helps she could review her knowledge, thus helping to renew points that have been forgotten. R. W. C.

"Cosmetic Surgery—The Correction of Featural Imperfections." By Charles C. Miller, M. D. Second edition, enlarged. Chicago: Published by the Author, 70 State St. 1908. 12mo., cloth, $1.50 prepaid.

The first edition of this little book was soon exhausted, showing the author's efforts to explain his methods of treating facial blemishes have been well received by the profession at large. In this edition the paper is better, and altogether the work makes a more favorable impression, though many of the cuts are still unsightly and tawdry-looking in this day of process engraving.

State Board Questions and Answers. By R. Max Goepp, M. D., Professor of Clinical Medicine at the Philadelphia Polyclinic. Octavo, 684 pages. Philadelphia and London: W. B. Saunders Company, 1908. Cloth, $4.00 net; half Morocco, $5.50 net.

This work reminds one of Hartshorne's "Conspectus" in great favor with medical students years ago. The foundation for it is the answers to questions asked by the principal state boards during the past four years. These have been arranged under twelve branches, including physics and chemistry, in logical sequence and with a few queries interpolated to maintain the continuity of the subject. There is an index of fifty-two double-column pages in fine type.

Of course, there is no scope for originality in such a work, but as the answers have been taken from approved sources the book should prove of value to any one desiring to refresh his memory, whether it is proposed to pass a state board or not.

Irreducible hernia is certainly more often met with among the laboring classes than among those whose occupation is lighter, and this in a greater degree than can be accounted for by the larger proportion of instances of hernia generally found in the former status of society. Again, a subject who is habitually careless as to the condition of his hernia is very liable sooner or later to be afflicted with irreducibility of the same.—*Eccles.*

Personal

Dr. R. M. Penick, Shreveport, La., has been appointed chief surgeon for the Louisiana Railway and Navigation Company.

Dr. Samuel Bell, of Beloit, Wis., local surgeon for the St. Paul, has been elected medical director of the department of Wisconsin, G. A. R.

Dr. D. W. Lynch, local surgeon at West Bend, Wis., for the C. & N. W., died at his residence on June 25, aged 60. The doctor was a graduate of Chicago Medical College, class of 1875.

At the recent thirteenth annual meeting of the Soo Valley Medical Association, Dr. P. E. Sawyer, of Sioux City, Iowa, local surgeon for the C. & N. W., was elected vice-president, and Dr. G. G. Cottam, of Rock Rapids, Iowa, local surgeon for the St. Paul, a member of the board of censors.

Dr. T. E. Schumpert, who died at Shreveport, La., on May 15, 1908, was chief surgeon to the Louisiana Railway and Navigation Company, division surgeon to the Kansas City Southern Railway and local surgeon to the Vicksburg, Shreveport & Pacific, the Texas & Pacific, the Missouri, Kansas & Texas, the Cotton Belt and Shreveport Electric Railway Companies. During his life the doctor had performed many notable operations, for example, ligation of the subclavian artery, and suture of the heart.

The Tri-Railway Surgeons' Association was organized at New Orleans, La., under the direction of the popular chief surgeon, Dr. E. Denegre Martin, June 11, 1908. This association is composed of the surgeons representing the New Orleans & Northeastern, the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific Railways, familiarly known as the Queen and Crescent Route. The officers elect are: President, Dr. C. W. Bufkin, Hattiesburg, Miss.; vice-presidents, Dr. J. J. Haralson, Forest, Miss.; Dr. H. F. Wilkins, Rayville, La.; secretary, Dr. J. D. Martin, New Orleans, La.; treasurer, Dr. R. W. Thompson, Lumberton, Miss. At night a banquet was tendered the surgeons by the railroad officials.

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Accoucheur to the Paris Hospital.

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Except with patients who are practically dying, rise of temperature always occurs one or two hours after a collargol injection, reaching its maximum after the rigor. It only lasts a few hours and is followed, in the most favorable cases, by rapid defervescence or defervescence in lysis, the temperature becoming normal in two to six days if recovery is to be obtained by one injection. When further injections are necessary, hyperthemia takes place after each. The rise is sometimes considerable; in one instance, in which total defervescence followed in 36 hours, the temperature reached 108°.

Although less frequent the rigor which accompanies or precedes the hyperthemia and the leucocytic manifestations is fairly regularly observed, particularly in favorable cases. In 40 cases of puerperal infection treated by collargolum at the Lariboisière Hospital we have been struck with the relative frequency of the rigor in cases which recovered and its rarity in fatal cases. In 27 ending in recovery, rigor was noted in 19 (75%), whereas it occurred but 4 times in the 13 that ended fatally (30%). The symptom therefore has prognostic value. It was absent in some patients who recovered, when the injection was made after a rigor due to the infection. It was always lacking in cases treated shortly before death. This rigor generally occurs only after the first injection, but we have observed it to be absent after the first and to appear after the following ones.

A third reaction, fully as common as the others, and to which all women themselves call attention, is the remarkable euphoria after an injection. Distressing symptoms—headache, intense thirst, dyspnea—disappear very rapidly. This was quite striking, for it took place in one patient at the same time as the rigor, while the temperature in the axilla rose to 108°. The rigor causes no more discomfort than that which follows normal delivery, and thus differs from septicemic chills.

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When we began to use collargol we had just encountered a long series of failures with Marmorek's serum. In January, 1903, we made our first timid attempt, injecting 2 c. c. of solution in a woman whose temperature oscillated between 100° and 104°, despite our endeavors. Defervescence was sudden and immediate, and was only disturbed secondarily by the appearance of an abscess. Since that day, taking only hospital cases into consideration, we have collected 40 complete observations. That this series of cases is so small is due to our desire, until quite recently, to reserve collargol for the most serious cases—cases that resisted all ordinary methods of treatment—in order to collect reliable statistics on the value of collargol.

Twenty-seven, or 70%, made favorable recovery. In 15 cure was obtained with one injection, in 7 with two injections, and in 5 with 3 to 5 injections. Four of the cases had not proved refractory, but as they were grave from the start—women with putrid fetus and

fever through labor or auto-contamination through extragenital suppuration—collargol was injected at once, in a certain sense as a prophylactic. Of the 13 who succumbed 9 received one injection, 3 of whom came to the hospital the day before death; 3 received two injections, and one died after long cachexia despite five.

We desire to lay stress on the fact that in the majority of cases we turned to collargol as our last ray of hope.—(*International Clinics*, 17th Series, Vol. III.)

RHEUMATISM DUE TO GRIP.

In speaking of the treatment of articular rheumatism, Hobart A. Hare, M. D., Professor of Therapeutics in the Jefferson Medical College, and editor of *The Therapeutic Gazette*, says: "Any substance possessing strong antipyretic power must be of value under such circumstances." He further notes that the analgesic power of the coal-tar products "must exert a powerful influence for good." The lowering of the fever, no doubt quiets the system and removes the delirium which accompanies the hyperprexia, while freedom from pains saves an immense amount of wear, and places the patient in a better condition for recovery. The researches of Guttmann show conclusively that these products possess a direct anti-rheumatic influence, and among those remedies antikamnia stands pre-eminent as an analgesic and antipyretic. Hare, in the latest edition of his *Practical Therapeutics*, says: "Salol renders the intestinal canal antiseptic." This is much needed in the treatment of rheumatism. In short, the value of salol in rheumatic conditions is so well understood and appreciated that further comment is unnecessary.

The statements of Professors Hare and Guttmann are so well known and to the point and have been verified so often, that we are not surprised that the wide-awake manufacturers placed "Antikamnia & Salol Tablets" on the market. Each of these tablets contains 2½ grains of antikamnia and 2½ grains of salol. The proper proportion of the ingredients is evidenced by the popularity of the tablets in all rheumatic conditions and particularly in that condition of muscular soreness which accompanies and follows the grip.

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Case 2.—Louis P., iron carrier. Right foot burned by molten iron splashing in shoe, Aug. 27, 1901. Glyco thymoline dressings applied every other day. Uneventful recovery by Sept. 16, 1901.

Case 3.—Martin S. Rigger. Stepped on rusty nail which ran almost through ball of right foot. Antiphlogistic dressing, after cleaning with $H.^2$ $O.^2$ This had to be removed in 24 hours on account of pain and swelling. Opening was then made larger, some pus escaped and a glyco-thymoline dressing was applied. Pain stopped, swelling was reduced and uneventful recovery occurred in five days.

I have memoranda of about thirty more cases, but there is such sameness about them that I will refrain from setting them forth more specifically.

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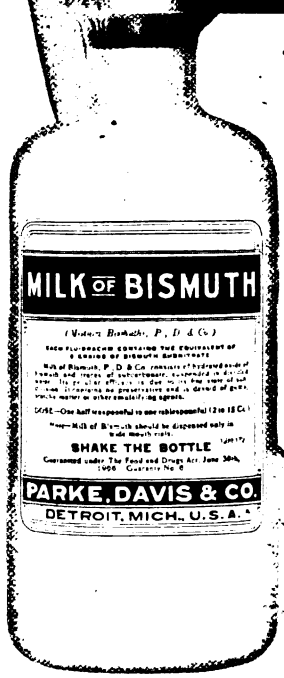

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The Railway Surgical Journal

Vol. XIV—No. 12 CHICAGO, AUGUST, 1908 Whole Number 267

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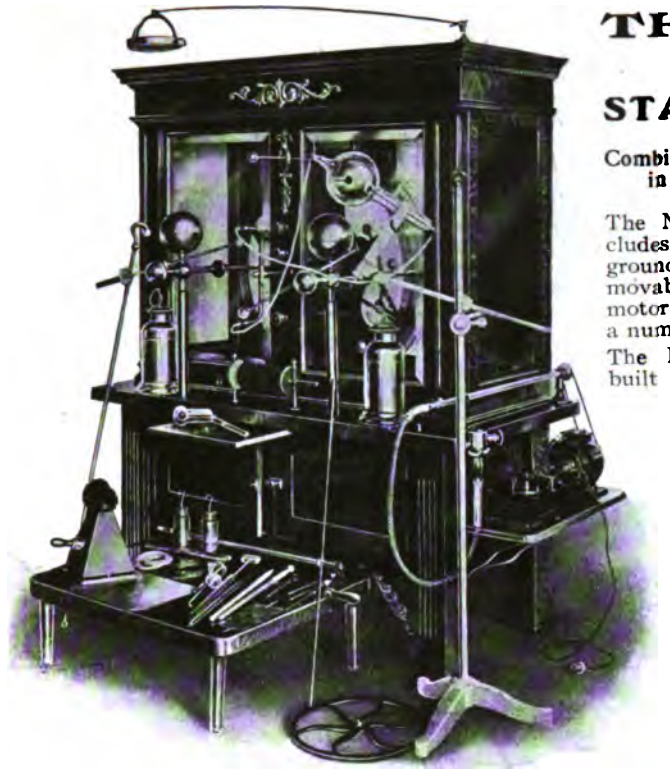

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SUBPARIETAL RUPTURE OF THE INTESTINE.*

W. C. DANFORTH, B. S., M. D., EVANSTON, ILL.

It is proposed in this paper to speak only of cases of abdominal injury resulting in rupture of the intestine. I desire at first to record the following case occurring in the County Hospital.

A boy of 14 was brought in with the statement that 36 hours previously he had been struck by a baseball bat on the lower part of the right side of the abdomen. He was taken home, began to vomit, the vomiting continuing during the night. Complained of severe pain in abdomen on lower right side.

Upon examination:

1. Boy, poorly developed.
2. Face wet with perspiration. Pupils equal and react, but are very large. Rolls head continually from side to side.
3. Chest negative.
4. Abdomen—Point of tenderness on right side below umbilicus. Recti tense, especially the right one. Tympany all over abdomen. Dullness in flanks, changing with posture.
5. Extremities—Knees drawn up, restless.

This boy was immediately operated, a tear about 1½ inches in length and diagonal in direction, being found in the lower portion of the ileum. A general suppurative peritonitis was present. The tear was sutured with Czerny-Lembert sutures, and the abdomen closed with drainage. Death, however, ensued 24 hours after operation from the peritonitis.

The case, however, illustrates several of the features of interest which are to be observed in cases of intestinal rupture.

When the question of etiology of intestinal rupture is inquired into one finds the following features of importance.

A. PREDISPOSING FACTORS.

1. *Age*—20-50, these being the years of active physical labor.
2. *Occupation*—Laborers, stablemen.
3. *Sex*—In the recently published work of Hertle, from the surgical clinic in Graz, it is noted that it occurred in men 124 times and in women 4 times.
4. *Previous Pathologic Conditions in the Body*—(a) Peritoneal adhesions, limiting the motion of the gut so that it cannot escape the trauma.

(b) Ulcerations of intestine.

(c) Hernia, especially the irreducible type.

5. Extreme fullness of the intestines certainly predisposes to rupture.

B. ACTUAL CAUSES.

[Thirty-four cases (Hertle.)]

The causative trauma may be divided into two classes—those with a broad area of contact, and those with a circumscribed area of contact.

1. *Broad Area of Contact.*

1. Crushing between two railway cars—between a wagon and a wall—elevator and floor, etc.
2. Being run over by wheels of wagons.
3. Falls, the abdomen striking broadly.

*Read at fifteenth annual meeting C., M. & St. P. Railway Surgical Association, Chicago, December 5, 6, 1907.

II. *Circumscribed Area.* 98 cases (Hertle).

1. Horse kicks.
2. Blows by wagon pole.
3. Fall upon pointed objects.
4. Blows from clubs, stones, balls, etc.

III. Those cases in which *rupture follows a fall,* in which the abdomen itself was not struck, the intestines having ruptured as a result of indirect force, or "shaking oscillation," as it has been termed.

As to the mechanism as a result of which the injury occurs we find that the cases may be practically grouped under three headings:

I. *Bursting.*—These cases are either those in which the patient has sustained a fall, not striking upon the abdomen, but sufficient in force to so shake or violently move the gut that a rupture ensues; or, cases in which a blow upon the abdomen which acts mechanically to produce an increase of pressure near the point of contact which overcomes the power of the intestinal wall to resist. This force has been experimentally determined in the intestines of dogs to be 300-520 mm. of mercury.

II. *Crushing Through of Intestinal Wall.*—In this form of mechanism a loop of intestine is forced backward by the contusing body against the spinal column, the most prominent bony formation in the abdomen, between which and the contusing body, covered by the abdominal wall, it is crushed. In injuries caused by sharp edged bodies it may readily be seen that a separation of continuity may easily be caused. However, many cases are attributed to this form of mechanism which should really be looked upon as cases of bursting.

III. *Tearing by Traction.*—It has been assumed in some cases that the contusing body, moving rapidly, a horse's hoof for instance, might catch a loop of gut through the uninjured abdominal wall and tear it by simple traction. This form of force might also cause a separation of gut from the mesentery.

As to the seat of the tear in the intestinal canal, we find that almost any portion of the intestine may be injured, although injury is by far more likely to occur in the small intestine. In the Graz cases the localization was found to be as follows:

I. Small intestine (92 per cent)		112
Duodenum	31	
Jejunum	12	
Ileum	29	
Small intestine	40	
(No closer point being given.)		
II. Large intestine (8 per cent)		22
Cecum	2	
Colon ascendens	2	
Colon transversum	2	
Colon descendens	1	
Sigmoid	3	
Rectum	1	
Large intestine	11	
(Localization not accurately quoted.)		

Da Costa states that of 78 cases the ileum was injured 42 times, the jejunum 20, duodenum 10 and colon 6, using figures given by Gage.

Chavasse quotes 116 cases of injury of the small intestine and 19 of injury of the large intestine.

So we see that the great majority of intestinal tears tend to occur in the small intestine, and this is probably at least in part due to the fact that the small gut occupies the central portion of the abdomen, and, thus is more exposed to injury.

The intestinal wounds occur most frequently on the convex border of the gut, opposite to the mesenteric insertion than at any other place. In number the wounds may be single or multiple. Of 134 cases noted by Hertle, 20 showed multiple wounds, the remainder having but one rupture.

As to size, the wound may vary from an extremely small opening to a complete severing of the gut. Diagonal tears 2-4 cm. in length are not at all uncommon.

As a rule, it is found the mucosa pouts out around the edges of the wound. In cases of very small wounds this pouting may suffice entirely to close the opening, so that no leakage of intestinal contents occurs.

The intestinal wound may not at the time of injury completely penetrate. In these cases secondary necrosis may follow, causing a perforation later. This has occurred as late as 12-22 days after the injury.

The symptoms of an intestinal rupture may be divided into first, general, and second, local.

General Symptoms:

1. Shock.—In 145 cases this was found to be present in 30, varying in degree.

2. Pulse.—May be normal at first, or may be markedly slowed, owing to vagus irritation. This slowness tends to disappear later, the rate returning to normal. In case a peritonitis appears, of course the pulse rate increases rapidly.

3. Respiration.—Is usually shallow and of the costal type.

4. Temperature.—As a rule remains normal until peritonitis appears. Occasionally when a hematoma is present an elevation may occur, even when no rupture is present.

Local Symptoms:

1. Free gas in abdomen, and obliteration of liver dullness. This develops as a rule shortly after the injury. A very large amount of gas at once would point toward a stomach injury.

2. Dullness in the flanks, coming on soon after injury and changing with posture.

3. Pain, spontaneous in character. The patient as a rule lies quietly in order to limit his suffering.

4. Tenderness upon pressure. This increases in severity as peritonitis becomes more severe. Of 136 reported cases this sign was absent in only 1.

5. Abdominal rigidity. Trendelenburg lays especial stress upon this and states that if no rigidity is present one may assume that no intra-abdominal injury has occurred.

6. Vomiting, repeated and recurring for several hours. This was especially marked in the reported case. Biliary vomiting occurs in many cases, and is of some importance in the diagnosis.

7. It is fairly frequent to have no passage of feces or gas, apparently due to adynamic ileus brought on by the trauma.

8. Passage of bloody stools is rare.

9. Blood pressure is as a rule lowered. (Riva-Rocci.)

10. Extreme thirst is sometimes complained of.

The *diagnosis* is made by observation of the symptoms noted above. Particular stress is laid upon the muscular rigidity, obliteration of liver dullness, of free fluid in the abdomen, tympanites, vomiting and leucocytosis. It was formerly recommended by Senn to insufflate hydrogen gas or air through a rectal tube and note whether the tympanites increased or not. This, however, tends to increase the escape of feces, and is, therefore, not at present approved. If any doubt exists, frequent observations should be made to determine whether the tympanites is increasing and the free fluid in the abdomen becoming greater in amount, and frequent leucocyte counts should be made. In the usual case, however, one may be reasonably sure soon after the injury.

Treatment.—This may be summed up by saying that laparotomy should be performed as soon as the diagnosis is made. The fact that the contusing force has been a slight one should in no case influence one to delay operation, provided signs of damage are present, for as E. J. Senn stated in 1904, "the degree of injury is no criterion whatever as to the future aspect of the case." It has been said by Sir William MacCormac that in no condition is the rule "when in doubt, operate," more applicable.

The incision is best made below the umbilicus, though the linea alba or rectus close to the median line. The intestine should be looked over carefully, beginning at a fixed point. Small rents are best united transversely to the long dimension of the bowel. A large tear, or two tears in close proximity, are best dealt with by resection, if the patient's condition permits. Separation of the gut from the mesentery also demands resection of the separated portion.

If the patient is in extremely bad condition, especially if an ileus is present, and the intestines are much distended, it is well to suture the tear into the abdominal wound, thereby making an enterostomy and providing for intestinal drainage. Lives may be saved by this procedure which would be lost by an attempt at suture or resection. In these cases, if the fistula does not spontaneously close, a secondary operation for closure must be made.

For the peritonitis, adequate drainage must be instituted. In these cases the procedure recommended by Murphy for the treatment of general peritonitis cannot be at present improved upon. The head of the bed is to be elevated, and a continuous slow flow of hot salt solution under low pressure into the rectum should be kept up. The flushing out of the abdomen is not favored. The fecal extravasation may be gently sponged out, using care not to disturb or break up the plastic exudate upon the peritoneum.

That early operation is all important cannot be doubted in the face of the statistics at present existing in the literature. The fatal result which is practically invariable when no operation is done, indicates that any form of treatment which gives even a small percentage of recoveries is to be preferred. The statistics show a marked difference in favor of an early operation as opposed to one which is delayed.

Hertle quotes the following figures, indicating strongly the value of early operation:

Operation in 4 hours, mortality.....15.2%
Operation in 5-8 hours, mortality.....44.4%
Operation in 9-12 hours, mortality.....63.6%
Later, mortality .....70. %

Of 116 cases occurring before 1887, 45 were not operated. These all died. Forty were operated. Of these 17 recovered. So that even the less perfect technic of twenty years ago illustrates the value of an attempt at repair and drainage.

We may say, then, that the patient's entire salvation depends upon early laparotomy, with intestinal suture or enterostomy, and that control of the peritonitis is greatly aided by means of the use of salt solution slowly given into the rectum, coupled with the elevated position of the head of the bed.

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THE PROBLEM PRESENTED IN TREATMENT OF CONTUSIONS OF THE ABDOMEN.*

J. R. HOLLOWBUSH, M. D., ROCK ISLAND, ILL.

The problem presented in the treatment of contusions of the abdomen is one that is still open for a satisfactory solution. The treatment of the intra-abdominal lesions, depending as it does, upon the diagnosis, a more fitting title for this paper would perhaps be the problem presented in the diagnosis of abdominal contusions.

The question is one which appeals to all of us, as it is a proposition as frequently met with, or perhaps more frequently, by the general practitioner in the country as a surgeon in the city. I know of no class of cases that is attended with more perplexities or where the safety of the patient depends more upon the promptness and accuracy of the diagnosis. There is no time to be lost in analyzing symptoms, nor time in many instances to secure the aid of a consultant, nor to remove the patient any great distance to a hospital.

The amount of apparent injury bears little relation to the real condition. Injuries, where the traumatism is apparently great, make an uninterrupted recovery. Others, where the symptoms seem trivial for the first 24 or 48 hours, are followed by a fatal result. Contusions of the abdominal wall may cause hernia, laceration of either the solid or hollow viscera and rupture of the muscles and aponeuroses.

From the cases that have come under my observation, I have selected 4 which are probably typical.

Case 1.—C. M., a lad of some 9 years of age, while returning home from school, was engaged in a foot-race with some of his fellows, when he tripped and fell, striking upon his abdomen. I saw him a short time after the injury and found him suffering from shock, with cold skin, rapid pulse, and vomiting, with tenderness over the abdomen, but with no external signs of an injury. He soon

*Read at fifteenth annual meeting C., M. & St. P. Railway Surgical Association, Chicago, December 5-6, 1907.

reacted and was placed in bed and kept in a recumbent position. On the fourth day he apparently had entirely recovered and I discharged him. Two days later, I was hastily summoned to the house and found the boy in collapse and he died within a few minutes after my arrival.

Case 2.—C. L., while engaged in running a plank through a planing machine, the end of the plank was caught in the machinery, suddenly released, struck the young man over the side and front of the abdomen, with sufficient force to hurl him some 15 feet through the door of the planing mill. When I saw him he was in profound shock, bathed in cold perspiration, vomiting and with extreme tenderness over the entire abdomen and side. This tenderness was marked for several days, then gradually subsided. Hematuria followed and was so profuse that irrigation of the bladder was necessitated. His recovery was very slow but complete.

Case 3.—J. H., while entering the stable door, was kicked by a horse, the hoof striking him just above the umbilicus. He was thrown through the stable door and was lying in the yard in a profound condition of shock, when found by members of his family. He was carried into the house and when I saw him was suffering pain and vomiting freely, abdomen exquisitely tender to the touch. For several days the slightest movement, the jar produced by coughing or sneezing, caused intense pain at the seat of the injury. He made a slow recovery, but in the course of a few weeks was able to return to his work.

Case 4.—F. B., while running to his work stumbled over a truck standing in the dark passageway, a portion of the truck striking him across the abdomen. When I reached him he was suffering great pain and under a condition of severe shock. Examination revealed the right inguinal canal and scrotum filled with a hernial tumor. After reaction an attempt was made to reduce the hernia. This was found impossible and under chloroform anesthesia an attempt was again made, but was unsuccessful. He was then taken to the hospital where I operated on him for a radical cure of the trouble.

In Case 1, the fatal result was evidently due to secondary hemorrhage from laceration of a vessel, probably of the mesentery. This life could have been saved had laparotomy been done shortly after the receipt of the injury, although his symptoms did not seem of sufficient severity, nor was the amount of traumatism received considered severe enough to warrant an abdominal section. This accident occurred a number of years ago, when laparotomies were infrequent, but now in the light of a greater experience, we feel that this life was sacrificed.

In Case 2, there was laceration of the kidney. Operation was indicated and proposed, but declined by the patient and his family. The laceration was undoubtedly in the substance of the kidney and healing eventually stopped the hemorrhage. Operative intervention would have hastened his recovery and removed the element of danger present.

In Case 3, the injury received was apparently very severe and the external signs of injury were marked, yet, with the exception of pain in the abdominal wall itself, there was no untoward symptoms following the accident.

In Case 4, the traumatism was not great, the man only falling across the truck. He claimed never to have noticed a hernia previous to the fall and he had been a hard-working mechanic for many years. But the force of the fall was sufficient to crowd a great mass of omentum through the inguinal canal and into the scrotum. The operation disclosed an extremely small internal ring, requiring considerable enlargement before the omental mass could be replaced, proving that a very small amount of the force applied over the lower abdomen would cause marked intra-peritoneal injury. It is likely, had the abdominal wall not given away, a rupture of the vessel might have ensued.

In an article on this subject by J. E. Summers, he quotes freely from the paper by Bottomley, compiled from the Report of the Boston City Hospital. This paper is based upon a comparison of 20 cases of abdominal contusion followed by intestinal injury, proved either by post-mortem or operation, and 20 cases of

abdominal contusions which recovered without an operation. He says:

"Consideration of a combination of symptoms leaves us just as much in doubt regarding the diagnosis as that of individual symptoms. Of the 20 cases of intestinal perforation there are 11 different combinations of symptoms. Pain, tenderness, muscular soreness and vomiting were found associated 4 times; tenderness and external signs of injury 3 times. These are the combinations found associated in the greatest number of cases. They are certainly not incompatible with a very simply injury, and are of no importance from a diagnostic standpoint. Of the 20 cases of injury of the intestines, 19 died and 1 recovered. Eleven of the cases underwent operation and 9 were treated expectantly. Of the latter, all died; of the former, one recovered. Of the operative cases, 1 was submitted to operation four hours after entrance into the hospital; 4 operated on five or six hours after; 1 twelve hours; 4 twenty-four hours and 1 forty-eight hours after. All these died.

Nimier mentions 307 cases of abdominal contusions caused by horse kicks. All were treated expectantly, 215 recovered and 92 died. The 215 cases that recovered offered no particular lesson to us. Our interest lies in the 92 that died—how many of these would have been saved by an exploratory incision?

Schmidt finds that a mortality of 97.5 per cent has followed expectant treatment of the abdominal contusions with symptoms sufficiently severe to suggest possible perforation of the intestines. On the other hand, Petrie presents a table of 42 similar cases operated on which showed a mortality of 66.7 per cent, while Kerstein's 18 cases operated on resulted in a mortality of 55.5 per cent. In 4 of these cases, laparotomy was done within five hours after receipt of the injury. All these recovered, and his statistics bear out the fact that every hour that goes by after the receipt of the injury lessons a prospective cure by operation. The reported mortality of cases operated on the first twenty-four hours is 45 per cent; after the first twenty-four hours 66.6 per cent. These figures, compared with the 97.5 per cent mortality of expectant plan, speak for themselves and make a strong plea for very early interference."

It would follow from these reports just read that not one symptom or combination of symptoms is to be relied upon to any great extent in the making of our diagnosis. The one symptom upon which the most dependence can be placed upon is that of muscular rigidity. Of the 17 cases reported by Hartmann without rigidity, all recovered without operation. Of the 10 cases where the signs were well marked, 9 were successfully operated upon and distinct lesions found. The remaining case refused operation and died as a result of intestinal perforation.

Of the 4 cases reported by me in this paper, Nos. 1 and 3 were both marked by extreme muscular rigidity. No. 1 resulted fatally from secondary hemorrhage, while in No. 3 the muscular rigidity and tenderness was evidently due to the traumatism of the abdominal wall itself. In speaking of the muscular rigidity, I have reference to the muscular rigidity of the entire abdomen and not a localized rigidity or tenderness at the point of the receipt of the injury. This would be the natural result from the superficial injury. And while, as stated before, there are no symptoms or group of symptoms to be absolutely relied upon, yet in the general run of cases, when we are confronted with abdominal contusions followed by vomiting, shock, muscular rigidity and pain, we have sufficient reason for immediate operative intervention. In each individual case must be considered the direction of the blow, the condition of the stomach and bowels, regarding food contents, and the position of the patient when struck. Some cases may present symptoms sufficiently positive to indicate operative intervention at once. In others, they are so indefinite as to prompt one to delay.

But ever keep in mind the fact that apparently most trivial injury may be followed by sloughing of the bowel or secondary hemorrhage. If the extent of the injury could be ascertained, and whether the lesion is intra- or extra-peritoneal, the treatment would involve little indecision. But, in view of the fact that there is no sign within the first twelve to twenty-four hours to tell whether the intestine is ruptured, the expectant treatment is based upon unreliable premises, and will result, if followed, in the loss of lives and chagrin and mortification to the surgeon.

DISCUSSION ON PAPERS OF DRS. DANFORTH AND HOLLOWBUSH.

Dr. E. H. King, Muscatine, Iowa: These papers are conservative and terse and indicate to us that there are no specific signs which will tell us definitely how much injury the viscera have sustained. Each case must be studied by itself and our conclusions drawn accordingly.

Thirty-five years ago, in the early years of my practice, a boy about 10 was kicked in the head by a horse and recovered. About three months afterwards he was kicked in the abdomen by the same horse, was treated expectantly and died of rupture of the bladder. An early operation would have saved him.

About twenty-two years ago a boy about the same age was kicked in the hypogastric region, a physician said nothing could be done, the patient was treated expectantly and died of rupture of the bladder.

A boy of 10 was walking on the railroad track with a hand-car, fell, and the wheels ran up on the abdomen. He did not complain much, but it was said that he was "dumpish" and not as active as usual. Just one month after that I was called to see him with a well-defined abdominal tumor. His temperature had never been over 99, nor his pulse over 100, and he had never visited me during that time but I found an extensive abscess that had been produced by the contusion, which, fortunately, had been walled off. This was evacuated and the boy recovered, in this case the result of late operation. I do not know what the specific symptoms were at first, but from what I could learn they came on gradually and nothing indicated that he was severely injured, and it had been treated expectantly.

Another boy in my practice some twenty years ago was taken with a violent peritonitis for which I could find no cause. For three weeks I thought the boy would die. He had intense peritonitis, there was tenderness all over the abdomen with regurgitation of the greenish fluid, sometimes seen in severe cases of peritonitis. The boy was treated expectantly. Subsequently we found that he had been playing with some boy, he was sort of a street Arab, and in a fight a boy had kicked him in the left side of the abdomen. The general peritonitis subsided and I detected a localized dullness, subsequently made a diagnosis of abscess and evacuated an immense abscess. Here was a case in which late operation was effective.

These cases could be multiplied by a number of instances, but I will not occupy your time further, more than to say this: There is no specific rule by which we can judge how extensive an internal injury may be from a contusion or blow upon the abdomen; each case must be a study by itself.

Dr. D. C. Brockman, Ottumwa, Iowa: It is impossible to decide from the symptoms immediately after the accident the extent of an abdominal injury.

I remember four years ago seeing a boy three hours after he had been kicked in the pit of the stomach by a cow, whose tail he was twisting. He was in collapse and looked as though he would die in an hour from the time I saw him. I felt that we had a serious intra-abdominal injury, but the boy was not in condition to stand an operation. We waited till morning, merely using something to overcome the shock. In the morning we found the boy in good condition, the bowels moved naturally, and while he was sore over the abdomen, he showed no symptoms whatever of serious injury; he simply recovered from the shock produced by the blow over the abdomen and got along without further trouble.

The same evening after returning home from seeing that boy I saw an old gentleman who thirty-six hours before had struck himself in the abdomen while shoveling corn; he had been around the house all day, vomited occasionally, but had very little pain. Twenty-four hours after the injury he sent for a physician, he asked me to come, and when I reached the patient a few hours afterwards I found him moribund. Postmortem showed an extensive rupture of the ileum close to the cecum. That man had no shock or trouble, ate a good breakfast after the injury, and yet died from its effects.

The symptoms immediately following the injury will not always aid us in making the

diagnosis. The only thing to do in cases of doubt is to open the abdomen, which is an operation without danger if properly done, and see what is inside.

Dr. Danforth (closing): In the closing paragraph of my paper I tried to express the value of immediate laparotomy in cases of doubt. That is the question which is sometimes controverted. It is better to make operation where investigation proves it was not necessary, than not to make one where serious injury does exist. I think that is the whole proposition.

Dr. Hollowbush (closing): I do not know that I have anything to add, as no exception was taken to the statements in my paper.

The great trouble in these cases is that the amount of shock that follows immediately after a blow over the abdomen from irritation of the solar plexus, is just as great as that which follows the laceration of a viscus, therefore the symptoms are obscured by the amount of shock. As after rupture the recovery of the patient depends upon early operation, it is, as stated by Dr. Danforth, better to make a great many laparotomies and find nothing present, than to omit to operate upon one and have a fatal termination.

Inflammation of a hernia is due to many causes, among which may be mentioned: (1) external injury, as from the improper pressure of an ill-fitting truss or of one which has been improperly applied. Again, blows on the swelling, or prolonged and too severe taxis, will also tend to cause an inflammatory attack. (2) Acute strangulation. (3) Acute inflammation spreading from the interior of the intestine. All the above may give rise to an acute inflammatory process, but in addition (4) tubercle, new growths, etc., may affect the sac, and so lead to a chronic inflammation of the parts.

Any variety of inflammation of a hernial sac may bring about the formation of *adhesions*, and thus produce irreducibility of the contents of the sac. Inflammation is most common in femoral herniæ and more common in umbilical than in inguinal.—*Eccles.*

PENETRATING WOUNDS OF THE ABDOMEN—REPORT OF 24 CASES.*

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The cases here reported represent all of the cases of penetrating wounds of the abdomen which have come under my care. It is not my intention to go into a general consideration of this class of injuries, nor even to go fully into the recent literature on the subject. Those desirous of a full exposition will find the chapters on Gunshot Wounds and Penetrating Stab-Wounds of the Abdomen in Douglas' "Surgical Diseases of the Abdomen" the most satisfactory treatise which I have seen. Also in *Surgery, Gynecology and Obstetrics* (Vol. IV, page 202). E. C. Riebel in reporting 28 cases of "Abdominal Gunshot Wounds" goes into the symptomatology and treatment very thoroughly.

The tendency in treating wounds which are known to penetrate the peritoneal cavity has been towards early laparotomy, without attempting to determine beforehand whether the viscera have been injured. In fact this can no longer be called a tendency, for I suppose it is now the practice of every surgeon in civil life to open the abdomen at once in all cases seen early. We formerly heard much discussion of whether the wound was in the upper zone or not, of the hydrogen gas test, of the presence of shock as evidence of perforation, etc.; but at the present time, a wound which is suspected of having penetrated the cavity is sufficient indication in civil practice for exploratory incision.

The experience of military surgeons in the Spanish-American and Philippine Wars, in South Africa and Manchuria, has been directly the opposite of that gained by surgeons in civil life in this country. Various reasons have been given for the lessened mortality rate in cases not operated on and the increased rate in those subjected to operation in military life, but those reasons have weight with military surgeons and do not concern us in civil prac-

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tice. As Dr. Wyllys Andrews very forcibly expresses it:

"We should go on and urge as strenuously as possible that it is our duty in civil practice, not only to open every case of abdominal perforation which we may diagnose, but also to open every case of gunshot wound in or about the belly cavity which we can not diagnose but only suspect to have wounded the viscus."

The mortality rate at the present time of cases operated on is around 35 per cent, regardless of the time which has elapsed from receipt of the wound to operation. When they can be operated on within a few hours, the rate is very much lower.

Riebel's report referred to gives 26 cases operated on with 9 deaths—34.6 per cent.

R. Winslow, *Journal American Medical Association* (Vol. XLV, page 1,758), reports 29 cases, 24 operated upon with 9 deaths, mortality rate 37.5 per cent.

In my 24 cases here reported, 18 were operated on with 6 deaths, a mortality of 33.3 per cent. Not counting case 15, which died on the table from hemorrhage, we have 17 cases with 5 deaths, a rate of 30.6 per cent. Of the 24 cases, 12 were operated upon in less than 6 hours; of these 12, 2 died, giving a rate of recovery of 83⅓ per cent. I would call attention to the fact that in both of these deaths it was a wound of the liver which proved fatal, and not an injury of the hollow viscera. Of the 6 cases not operated upon, 3 died and 3 recovered. One of these 6 was seen 16 hours after injury and he was moribund; none of the other 5 was seen under 24 hours.

The decreased death rate in these cases is due to three things: 1st, and most important, to prompt operation in all cases seen early; 2d, to the free use of normal saline; and 3d, Fowler's position.

One other point I wish to mention, and this is that when shock is present it is more than likely due to hemorrhage and is not a positive symptom when present nor a negative symptom when absent of perforation.

1. Gunshot Wound.—Negro brakeman, seen 11 hours after he was shot. When he entered hospital his general condition was good, pulse 84, no evidence of shock. Wound of entrance below and to right of umbilicus. Median laparotomy done at once, assisted by Dr. McGehee. When abdomen was opened, onions, potatoes and other food floated up into wound. Six perforations of small intestine were closed with Lembert suture and 11 inches resected with Connell suture anastomosis. Death on fourth day. Postmortem showed diffuse suppurative peritonitis. No leakage either at anastomosis or at site of any of the perforations.

2 Gunshot Wound.—Mr. F., age 34, white, engineer, was shot at Tutwiler, Miss., and reached St. Joseph's hospital 10 hours later, condition good, no shock. Wound of entrance about center of epigastrium. Operated on at once by median laparotomy under chloroform anesthesia. None of hollow viscera found injured. Under surface of right lobe of liver grooved for 5 inches. This was closed with catgut sutures and drained. Patient died on third day from pneumonia.

3. Stab Wound. Negro man, 28 years old, case of Drs. Barbee and Williamson, was cut into abdominal cavity to left of umbilicus; other wounds on left side of trunk, left shoulder and wrist. Shock was profound; due to excessive loss of blood. Patient reacted promptly under administration of intravenous transfusion of normal salt solution one quart, adrenalin chlorid solution (1/1000) 1 dram. Operation four hours after injury and two hours after reaction from shock. Abdominal wound enlarged and protruding omentum ligated and removed. None of hollow viscera perforated. Recovery uneventful.

4. Gunshot Wound.—Negro boy, 18 years old, brought into City Hospital thirty hours after being shot. Wound of entrance in right nipple line below tenth rib. The liver must have been penetrated, but as no unfavorable symptoms were present, no operation was undertaken. The patient left hospital on 10th day with no apparent bad effects.

5. Gunshot Wound.—Negro man, 26 years old, brought to hospital promptly and operated on within three hours after injury. Wound above and to right of umbilicus, condition good. Incision was made through right linea semilunaris and hollow viscera examined. Three

perforations of small intestine closed; the liver was badly torn. Wound of liver was packed and upper part of incision left open for drainage. After operation, patient's temperature gradually rose to 106° before death, 36 hours later. There was no peritonitis, but death was evidently due to toxemia or sapremia from infected liver tissue.

6. Gunshot Wound.—Negro man, 35 years old, shot at close range—load (duck shot) taking effect in left hypochondrium, tearing an opening into which the hand could have been introduced. Brought to the City Hospital at once and operation was done within three hours. Patient's condition good. Wound of entrance was packed and abdomen opened in left linea semilunaris. Numerous small perforations of small intestines and splenic flexure were seen and small intestine for 11 inches found cut into shreds. Seventeen openings in small intestine and six in the colon were closed with Halsted sutures and 12 inches of small gut resected with Connell suture anastomosis. Retroperitoneal drainage left through wound of entrance. Patient recovered without unfavorable symptoms.

7. Gunshot Wound.—Negro woman, 28 years old, entered City Hospital 48 hours after being wounded. Bullet had passed through biceps and into body at seventh interspace in axillary line, left side; another wound under right nipple. Condition on admission, temperature 102½; pulse 130; respiration 40-50. Not complaining of any pain, abdomen distended but soft. Physical signs of double pneumonia. Death 60 hours after admission. At the autopsy, we found a localized peritonitis of the lesser cavity with a large abscess surrounding a perforation in cardiac end of the stomach.

This case was remarkable for the absence of symptoms pointing to penetration of the abdomen. She gave no history of having vomited blood nor was there nausea or vomiting after she entered the hospital. Perhaps the pneumonia overshadowed or masked the symptoms of peritonitis. At least there was no suspicion of abdominal injury until discovered postmortem.

8. Gunshot Wound.—L. W., negro male, age 23. Shot May 12, 1906, 5:40 a. m. Brought immediately to City Hospital. Condition good. Shock slight. Operation at 9 a. m. Wound (.38 calibre pistol) 2 inches to right of umbilicus. Incision through right semilunar line. Three perforations of small intestine within space of three inches. This portion of gut resected with Murphy button anastomosis. Large ragged wound through right lobe liver (antero-posterior) which was packed and drained through counter-opening in hypochondrium. Intravenous transfusion of saline and adrenalin because of shock, before return to bed—Fowlers' position after reaction. Patient did well for three days, when symptoms of peritonitis developed, which were thought to be due to leakage, but on May 24th an abscess in right lumbar region was opened and drained and bullet found. Patient then improved rapidly, though a sinus persisted, which was believed to be fecal and for the closure of which an operation was undertaken six weeks later. It could not be traced to the bowel but led to the old wound in the liver and the free drainage provided resulted in prompt closure. So far as I know, the Murphy button has never passed.

Dr. Oliver tells me that over a year after this injury, he opened an abscess in the abdominal scar and in the pus found a chromicized catgut ligature, which showed no sign of absorption.

9. Stab Wound.—T. B. C., white, was taken to St. Joseph's Hospital by Dr. R. B. Gardner immediately after being stabbed. Operation one hour after injury; condition normal. Wound one-half inch long in left semilunaris on level with umbilicus. Wound enlarged and a piece of omentum, size of middle finger, found protruding from slit in peritoneum, this was resected. Careful search throughout small intestine revealed no perforation. Wound closed without drainage. Recovery.

10. Stab Wound.—F. S., 28, white, engineer. Arrived at St. Joseph's Hospital October 14th, 24 hours after being injured. Dr. R. B. Simpson, who saw the patient soon after the injury, found an extensive wound of left chest wall extending through pectoralis major and a wound 3 inches long from which omen-

tum was protruding above Poupart's ligament on the left side. He had resected the omentum and closed the wound as best he could under unfavorable surroundings and without help. When patient arrived in hospital he was almost *in extremis;* suffering intense pain, vomiting, temperature subnormal; pulse 130-140 and feeble. Abdomen rigid. He was given intravenously one quart normal saline with one dram adrenalin solution, which improved his condition markedly. The abdominal wound was reopened and a large hematoma found just outside of peritoneum due to the deep epigastric vessels having been severed. These were ligated and more of the omentum removed. There was no injury to the hollow viscera. Patient was returned to bed with pulse over 150 but reacted within a few hours and had slow convalescence complicated by a well marked attack of appendicitis in the second week.

11. Stab Wound.—Negro woman, 32 years old. Entered City Hospital two hours after injury and was operated on at once. Wound just above and to left of umbilicus, enlarged and abdominal viscera examined. Small intestine punctured in 5 places. Perforations closed with Halsted suture; abdomen closed. Prompt recovery.

12. Stab Wound.—P. C., age 32, white. Stabbed November 14th, in the morning. Entered St. Joseph's Hospital November 15th, 5 p. m. I saw him at 8 p. m. and found temperature 102, pulse 120, respiration 45, pain severe, abdomen rigid. Two incised wounds under free border of ribs in left side. Upper one 4 inches long, penetrating the cavity; a piece of omentum as large as my hand was protruding and in its folds were several dirty twigs and chips of wood. Pus already formed. The omentum was resected and drainage provided for, but patient died on the fifth day of general peritonitis.

13. Gunshot Wound.—Negro 26 years old, male. Entered City Hospital November, 1907. Moderate shock. Operation two hours after receipt of wound. Bullet entered just below umbilicus: no wound of exit. Median incision; three wounds of mesentery, bleeding profusely; bleeding points secured and openings closed. Five perforations of small intestine closed with Halsted suture. Drain to bottom of pelvis. Transfusion of saline and adrenalin solution. Fowlers' position after reaction. Uncomplicated recovery.

14. Gunshot Wound.—Negro, male, 20 years old. Brought into hospital at same time as case 13. Condition normal, operation four hours after injury. Wound of entrance just within right iliac spine. Median laparotomy; no visceral injury. Bullet had passed just within peritoneum downward and inward through prevesical space and was found imbedded in ramus of pubis to the left. Recovery.

15. Gunshot Wound.—Negro man, 42 years old, admitted 9 hours after having been shot. Condition desperate. Symptoms of severe hemorrhage. Wound under point of ninth rib. As rapidly as possible abdomen was opened and saline transfusion intravenously started but patient died on table before bleeding point could be secured. There were several perforations of small intestine; bleeding was from two cuts in mesentery.

16. Gunshot Wound.—Negro boy, 21 years old. Brought into City Hospital by Dr. Coker, of Tunica, 16 hours after injury. Patient's condition desperate. Was taken immediately to operating room and anesthetic started. When the dressing was removed, it was discovered that a load of buckshot at short range had torn a hole in the right side about 5 inches in diameter, exposing thoracic and abdominal cavities. The right lung, the liver, gall bladder and the hepatic flexure were riddled; so much could be seen through the opening which existed. The case was all together helpless and no operation was attempted. Death 24 hours later, peritonitis.

17. Stab Wound.—Mr. H., age 37. On the night of July 3, 1907, was stabbed in a street fight. He was very drunk at the time, but managed to get home, a distance of 1½ miles, without assistance. He was seen by Dr. J. L. Andrews probably with an hour and carried to the City Hospital. We began operation not over two hours from the time of injury. The skin wound was 2 inches to the left and below umbilicus. This was enlarged and found penetrating the cavity, which was full of blood.

Hemorrhage was found to come from mesentery. Three perforations of small intestine were found and closed with Halsted suture. The abdominal wound was closed after having introduced drainage to bottom of pelvis through a small opening made just below pubes. Patient put to bed in good condition and placed in Fowler's position in a short while. Recovery.

18. Stab Wound.—John B. Negro, age 18. Stabbed September 7, 1907, 6 p. m., and brought to City Hospital immediately. This case was in Dr. Oliver's service, operated on by me at his request, as he was unable to attend. Operation at 8 p. m. Condition of moderate shock, some pain, abdomen rigid; punctured wound 2½ inches below and 1 inch to left of ensiform. Median laparotomy. Great quantity of blood in cavity accumulating as rapidly as it was sponged out; after considerable difficulty the bleeding point was found in the head of the pancreas. This was controlled with two catgut sutures. Two perforations of stomach, one in anterior wall, the other opposite in posterior wall were closed with Halsted suture. A cigarette drain was introduced through omentum into lesser cavity and left for 72 hours. Fowlers' position after a few hours. Patient's condition improved and he recovered without complications.

19. Stab Wound.—W. S., white, age 36, stabbed some time during the night of October 13, 1907. Seen at 8 a. m. next day by Dr. B. F. Turner and sent to St. Joseph's Hospital. He was brought into operating room at 11 a. m., approximately 12 hours after injury. No shock, quick pulse, due to alcohol. (He was drunk when stabbed.) There were several skin incisions on body and one deep punctured wound in back about lower border of left kidney. This wound was enlarged and kidney examined but found uninjured. Several freely bleeding points were secured. It was found that the peritoneal cavity had been punctured. The wound was closed with provision for drainage and the abdomen opened in left linea semilunaris. No injury to the viscera was discovered, however, and the abdominal wound was closed. Patient returned to bed in fairly good condition. In this case we feared *mania a potu.* and attempted to guard against this from first. Patient did well for first 36 hours, when there was a very copious hemorrhage from bowel. This recurred 4 or 5 times, but finally was controlled without further operative intervention and patient made good recovery. I can explain the hemorrhage only on the theory that the descending colon was scored from behind (retroperitoneally) and perforation occurred later.

20. Gunshot Wound.—F. C., white, aged 26. Was brought to St. Joseph's Hospital at 8 p. m., October 27th, giving history of having been shot 26 hours previously. There was a wound of entrance just at the top of the ensiform and a bullet was felt under the skin in the back 3 inches from spine at ninth interspace. Condition good, pulse 90, temperature 100. Right side of upper abdomen tender and rigid. Patient stated that he had not vomited, but had been taking liquid food. In view of the favorable condition of the patient and the absence of symptoms of injury to the stomach, no operation was undertaken. Bullet removed several days later with cocain. Patient remained in hospital under observation three weeks, but no unfavorable symptoms developed.

21. Gunshot Wound.—This case is identical to Case No. 20. Will B., negro, age 27. Entered the City Hospital, November 25, 1907, 30 hours after having been shot. Wound of entrance made by .38 calibre pistol in right mammary line, tenth interspace. Exit, tenth interspace behind 1½ inch from spine. Patient's condition good. No operation. Left hospital November 30. No symptoms.

22. Gunshot Wound.—Mary B., negro, age 32, was shot November 29, 1907. Brought to City Hospital and operation done within 3 hours. Patient suffering great pain, shock marked. Wound in epigastrium to left of median line. Upper abdomen opened, free hemorrhage, all coming from a ragged wound through liver. This was the only visceral injury found. Hemorrhage checked by gauze packing left in situ. Bullet lying free in pelvis. Patient died from septic hepatitis on the seventh day.

23. Gunshot Wound.—J. P. White, age 10,

was shot with a .22 target rifle on morning of January 1, 1908. Sent to St. Joseph's Hospital by Dr. J. M. Coppage, of Lepanto, Ark., arriving 36 hours after injury. Wound of entrance 2 inches within left anterior superior spine. Exit 1½ inches below crest of ilium. When seen this boy's temperature was 102, pulse 140, respiration 40, feces oozing from wound of entrance. Abdomen greatly distended. No operation was done. Apparently he had diffuse peritonitis but the general symptoms subsided rapidly and by the fifth day his condition promised recovery. He died, however, on the ninth day from progressive septicemia from infection of the abdominal wall. No postmortem obtained.

24. Gunshot Wound.—Mike C., age 37, white, watchman, I. C. North Yard. Was shot, January 30, 1908, by car thieves. Carried to City Hospital and operated on within one hour of injury. Bullet passed through second phalanx right thumb, and into abdomen almost at McBurney's point. Patient complained of some pain and abdomen was quite rigid, but there was no shock. Oblique incision made through wound, no hemorrhage but fecal matter and pledgets of clothing found in cavity. Ileum 4 inches from valve severed by two perforations opposite each other. These converted into one, edges trimmed and closed by Connell enterrorrhaphy, practically an end-to-end anastomosis. Bullet found free in pelvis. Cigarette drain carried into pelvis from lower angle of wound and patient placed in Fowler's position for a short while. Aside from some infection of parietal wound, patient had uncomplicated recovery.

DISCUSSION.

Dr. W. H. Allport, Chicago: I do not know when I have heard a paper giving me as much pleasure as this of Dr. Malone. I think the benefit in hearing such papers comes more from the fact that we can check our own experiences with them, than from their teaching us what we do not already know. Dr. Malone has not perhaps told us anything which we have not already heard from other records, but every paper along this line represents an advance in the study of a very formidable group of cases.

We find Dr. Bull and his contemporaries commencing to operate nearly thirty years ago for gunshot wounds, in the old Chambers Street Hospital in New York—an old public court building turned over to the city surgeons because the authorities did not think it worth while to build a new hospital, and the surgeons used the dirty court-room—where it was impossible to obtain even ordinary cleanliness—as an operating room. They operated early in all abdominal cases. Surgery of this kind has made an advance, but we have to thank, I believe, pioneers like Bull and C. T. Parkes more than the surgeons who today are still making the way plainer. Those men thirty years ago had nothing but the courage of their convictions to guide them, now it is reasonably obvious how to proceed. Whether we see such patients in private homes or in our hospital service, they should be treated on the same basis, because the conditions are internal and must be reached at once. If a patient has a penetrating wound of the abdomen (and it is safe to say that any wound of the abdomen may be penetrating), it is our duty to go in, whether the case is that of a negro in his hut or a patient in the best hospital available. We have to go back to the old Chambers Street Hospital to see really where this movement began, and should give Bull and his colleagues the credit for inaugurating it. Although they had to operate under conditions which were recognized as unfavorable, yet they obtained results far ahead of the results formerly secured by conservative surgeons under military teachings.

I wish to speak in this connection about one or two of my own experiences and mistakes, for it is by those that I, at least, have profited most.

A case came into my service some time ago which presented signs and symptoms of a suspicious nature, yet I adopted a conservative course, allowing time to slip by during which I could have probably saved a life: A mechanic was struck in the abdomen by pieces from a bursting emery wheel; it was impossible to find out if the bowels had moved; there was slight ecchymosis on one side of the abdomen, but no break in the wall; there were pain and

abdominal rigidity; the patient had not vomited, but showed symptoms of great shock; he looked badly, but the case hardly seemed clear enough at that time to warrant operative intervention. I left instructions to be advised how the patient was that evening. The interne in charge reported that the patient was "all right" except that he had considerable pain and the bowels had not moved; temperature not reported, but it turned out to have been 102° that night. The next day the picture was entirely changed; the rigidity had not mitigated, the patient had vomited and the bowels had not moved; the temperature and pulse were rising. There was a tendency to balloon a little—not on the rigid side. I then, after the lapse of twenty-four hours, went into the abdomen, and discovered a complete rupture of the ascending colon exactly under the point where the man had had the blow on the belly; extravasation of the entire breakfast and perhaps dinner of the night before had taken place into the abdominal cavity. The pelvis was reeking with feces, and peritonitis of the most infectious character had made its appearance. The abdomen was full of fluid, blood, etc., and in spite of resection and thorough cleansing and drainage, the man died. I have not had this experience since, because I have not allowed it; but it represents experiences happening only too often.

When it comes to penetrating wounds, or wounds supposed to penetrate—it is our plain duty to go at once inside the abdominal cavity and find out what has happened.

Cases like the following are often quoted as excusing delay: A man shot square in the abdomen, the bullet afterwards found not to have gone through the peritoneum, but to have followed the muscles; shock and vomiting present. I suppose all of us have had this experience: A man shot over the heart, the bullet going around and not touching the heart at all; shock was profound for two days. But these cases are mere curiosities, and undue consideration of them but clouds a vital diagnosis. It is our plain duty to go out and preach the doctrine of immediate intervention, without any peradventure of doubt. We cannot by so doing endanger any case, and may save life.

With reference to the matter of drainage, I like to hear Dr. Malone refer to the cigarette drain. Many of us do not have the confidence in the cigarette drain we should have—and not in one, but in a dozen, if necessary. They should go into all the pockets of the abdomen—and to the bottom of them. I think an excellent method is to put a cigarette drain into the pelvis alongside the glass drain which is used to draw up the larger portion of the fluid, and after the latter is removed let the cigarette drain do the work for another twenty-four hours. Let the cigarette drain stay even forty-eight hours, then take it out and put in a twisted wick of rubber tissue—the ordinary protective twisted in this way (indicating)—and along the little interstices of the rubber drainage continues to take place.

As to the withdrawal of cigarette drains: A second drain should be put in immediately after removal of the first cigarette if we intend to provide for further drainage. If we do not put in this drain at once (and "at once" does not mean within 5 minutes, but *5 seconds*), the bowel or omentum pushes in and takes its place;—have the new drain ready and insert immediately, when it falls into the cavity without trouble; if you wait, it is practically impossible to insert it.

As many cigarette drains should be used as necessary. One favorite way is to drain from the pelvis, using a glass drain with gauze alongside it. If there has been much extravasation and there are pockets of septic fluid, a drain across the abdomen can be passed to the umbilicus and even to the region of the spleen. Another drain should be passed up under the liver; the journals are full of reports of subhepatic abscesses, etc., following abdominal injuries, all the results of leakage toward the liver, for pus will go wherever gravity takes it—hence the value of the Fowler position. The fourth drain should go to the region of the actual trouble. These drains do not produce adhesions if the wound is well taken care of and there is no secondary infection of the drainage track.

Dr. R. E. Fort, Nashville, Tenn.: The dif-

ference in procedure in military and civil surgery is well known. 1st, in military surgery we have the high-velocity steel bullet, which produces a small, penetrating wound instead of a lacerated one; 2d, it has been, and always will be, impossible to have proper equipment for abdominal work on the battle field; and, 3d, in action of battle it is not possible to get at these cases as early as is necessary and as we do in civil life. Therefore, my remarks will be directed exclusively to civil surgery.

Dr. Malone has outlined an excellent technique. We will take into consideration first penetrating wounds of the abdomen produced by missiles. It is well known that under surgical surroundings—and this means hospital surroundings—an exploratory section can be done with little or no danger. It is, therefore, our imperative duty to at once explore all penetrating wounds of the abdomen. It is the rarest occurrence that we cannot get to hospital surroundings in a few hours. However, if this should be impossible, it is clearly our duty to convert our surroundings, as near as possible, into surgical ones and explore there. This is not free from danger but the danger is much less than procrastination.

As to our procedure in cases of blows by direct violence upon the abdomen, here our physical signs count for much. For, in contradistinction to penetrating wounds of the abdomen, we have a large per cent of these cases in which there is an absence of visceral rupture. I regard extreme rigidity of the abdominal muscles as the best diagnostic evidence of rupture. Immediate shock is often produced by solar-plexus violence but shock continued over a period of an hour is valuable additional evidence. But, if abdominal rigidity persists after reaction from primary shock, my observation is that it is an unfailing evidence of visceral injury and the case should be explored at once. Symptoms are as often masked or misleading in abdominal pathology. Therefore, if your symptoms are not clear cut and you are in doubt, give your patient the benefit of the doubt by submitting him to the safer procedure of exploration.

With reference to those cases in which a diffuse peritonitis has been established before they come under our care (and these constitute a fair percentage of the cases we see) two modern procedures have revolutionized our methods and have reduced our statistics beyond our most sanguine expectations.

Every surgeon here remembers the method of Clark. The patient was eviscerated, the abdomen irrigated with large quantities of saline and closed with as much saline as it would contain and the patient's head lowered in order that he might have rapid absorption through the diaphragmatic peritoneum.

Dawbarn has shown us later that no amount of irrigation will cleanse the intestinal coils in which much infection reposes, and we now know that the rapid absorption of the infected fluid through the diaphragm administers an overwhelming dose of toxins to our patient and, therefore, it became necessary to devise a method by which absorption would be slow which would allow the phagocytes to destroy the toxins as they were poured into the circulation. Following this thought Fowler devised the sitting position which, by gravity, put the infection into the pelvic peritoneum, which has a restricted power of absorption taking it away from the diaphragmatic peritoneum, which has the most rapid powers of absorption.

Observing the fearful mortality which followed evisceration and irrigation of the diffuse peritonitis, Murphy and others conceived the idea of closing the perforation or sources of infection, instituting multiple drainage through the loins and above the pubis in the male, and through the loins and through the vagina in the female, getting out with as little manipulation as possible and putting them in the Fowler position and adding to this continuous saving the entero-clysis given by the drop method. This technique has reduced the mortality from 30 to 40 per cent.

These conclusions have been arrived at upon the hypothesis, which is correct, that no amount of irrigation will sterilize all of the abdominal cavity, that evisceration and manipulation destroy lymph barriers which have been thrown out to minimize absorption and to localize infection; that drainage is the only method of elimination and that the semi-erect posture

facilitates drainage and restricts absorption of the toxins while drainage is taking place.

The method which I prefer is the Mickulicz tube which is a spirally cut rubber tube, filled to expansion with gauze wicks.

Dr. C. F. Smith, Kankakee, Ill.: I would like to ask one question. About six or eight months ago I had a stab wound to treat. The liver was perforated, or a small piece taken off the left lobe, and the knife had entered the stomach. The stab had been received soon after the taking of a hearty meal, and as a matter of course, when we went down in there we found the food had left the stomach through the large wound in its wall. We had no trouble in closing the wound in the stomach so the patient could take food within 48 hours. We cleansed the wound, we thought, thoroughly, and removed a little jagged piece of the liver. The intestines were not involved at all, and we had no trouble for five or six days afterward; but the man eventually died. When we went into the abdominal cavity for the last time and examined it, the liver seemed to be the cause of the entire trouble. The question I want to ask is, How can we best succeed in treating wounds of the liver? As to the bowel, the stomach, and all the rest, I think I understand what to do in those cases, but in this case, upon postmortem the liver seemed to me to be in better condition than it is when we have an abscess of the liver.

Dr. J. L. Wiggins, East St. Louis, Ill.: I think the main point to be remembered in these cases is to operate soon. The first experience that I had along this line was away back in 1887 or 1888, at a time when it took a great deal of courage to make up one's mind whether to make the effort to save or not. At that time there were few reported cases of recoveries, not to exceed 4 or 5, I believe. I was very fortunate in escaping some of the pitfalls that were in vogue at that time; that is, the question of the thorough use of antiseptics. I limited the preparation of the patient to the use of the razor and soap and water. I had him carried to the hospital on a cot, operated, and he recovered. I learned from that case, and I have never had occasion to change the procedure nor my opinion, that what we demand more particularly is the early operation, before there is paresis of the intestinal muscles and while the coats are inverted. If we operate then there is no occasion for washing out the abdomen, nor instituting drainage. In this case I sewed the abdomen up without drainage, a reckless procedure at that time, and the patient recovered.

However, what we have to deal with as railway surgeons is not penetrating wounds. You remember in the early history of spinal injuries, in 1838 I think, Sir Astley Cooper made the remark that if one case in a hundred recovered, the operation of laminectomy was justifiable. We took that position in the early penetrating wounds of the abdomen. We have hardly reached that position with reference to non-penetrating wounds; that is, where there is no external evidence of violence. Those are the points that require courage even to this day; this the class of cases where it is necessary for the surgeon to have all the courage and bring to his assistance every possible logical reason why there should be intervention. In most communities surgical operations are not courted. To do these operations, a man must have confidence in himself and have a general knowledge of conditions; that is, that the probabilities are where you have shock, where you have rigidity of the abdominal muscles, which we find not only in this class of cases, but in all others where there is involvement of the abdominal organs, the indications are that an exploratory incision is necessary. If we could but convince those interested that an exploratory incision is perfectly safe, that it adds nothing to the dangers, then we would have an opportunity in many instances to do work that would be the means of saving life.

I want to compliment the doctor upon the presentation of his paper and the number of good results he has had. We must operate in the farm-house as well as in the hospital, in the populous as well as in the rural communities, and I think that a fair estimate of recoveries in those cases would be 50 per cent at the present day; but even if not to exceed 25 per cent of recoveries, that is sufficiently in excess of those reported during the Civil War

(which was, I believe, 98 per cent of fatality in the non-operated work) to entitle the profession to congratulations on the advance made.

Dr. L. Sexton, New Orleans, La.: I wish to mention some statistics which were recently presented when this same subject was up for discussion in New Orleans. Our colored population in the South are very handy with their guns. There were 12 cases reported of non-operation, with 80 per cent recoveries—2 deaths and 10 recoveries. The question came up of studying the statistics of gunshot wounds, and it was proved that in private practice the non-operated cases have done as well as the operated cases. The individual if shot near the umbilicus two or three hours after a hearty meal, if in competent hands should insist on an opening being made. But if the patient was shot perhaps not within 2 or 3 inches of the umbilicus (because shortly after a full meal if the bullet penetrates there, perforation is almost sure to take place), we hesitate to operate; if three or four hours aftr a meal, Nature does a great deal. We had one case in the Charity Hospital in which there were 16 perforations, which were sewed up, and the patient recovered.

But when a case comes to you with an injury of this kind twenty-four hours old, peritonitis already started up, it certainly is a serious matter to open up the case and get the credit perhaps for having a funeral, when we consider the possibility that recovery might take place without operation. And then, Gentlemen, are we who are not experts in abdominal surgery, justified in making these openings? Much depends on that in my judgment. Each case is a law unto itself. We know that in extensive operation and handling of the intestines, there is much shock. If there is internal hemorrhage we must get in and stop that; but if we get the case late, not bleeding, let us not give the public a club to knock us with. Cases of late operation have been mentioned here, in which the patients died.

Dr. Malone (closing the discussion): Referring to the closing remarks of the last speaker, we should not, in my judgment, let public opinion keep us from doing what we think ought to be done. There will always be plenty of people to "knock us" and give us credit for being resporsible for death. We should not be deterred if we think we can give the patient a chance of life.

I am surprised to hear Dr. Sexton's remarks on Charity Hospital statistics. I had not heard them, but, in the words of Dr. Wyllys Andrews of Chicago, I give the feeling that is held by practically all surgeons in the United States today. These cases should be operated on early if we get them. After 24 hours, each case is a law unto itself. Of course, I would not operate on a man *in extremis,* nor on one, say 36 or 48 hours after being shot and with peritonitis, for, of course, he has a better chance to get well without operation.

Dr. Smith's question as to what causes us to lose these cases of liver injury, I must confess that I am entirely unable to answer. I call attention in my paper to the fact that the only 2 cases I lost out of 12 where the cases came to me early, were where the liver was torn, death being due entirely to this injury. In one case there was no other injury; in the other there were some perforation, but no peritonitis. I do not know why it is that the liver tissue becomes infected, whether it occurs from metabolism or what.

I did not report any cases of rupture of the bowel from non-penetrating injuries. Dr. Allport and Dr. Fort both discussed that point. I think, however, that Dr. Fort was right in suggesting that in rupture of the bowel in non-penetrating cases the main symptom we have to guide us as to whether or not there is rupture, is rigidity. Of course, this is not always a sure sign, because we have seen rigidity which has existed for some time in cases of non-penetration, due to extravasation or the condition of the muscle itself. Nevertheless rigidity is the main thing we have to guide us.

Dr. Allport and Dr. Fort both advocate carrying a drain to the point which was injured. I do not agree with the gentlemen at all in that. I believe in draining. I think the pelvic drain is the principal thing, and I would drain also through the loins in cases where I felt it was necessary, but I do not believe that it is best to carry a drain to the point of injury in the

bowel. I think we can put the sutures in to close the opening in the bowel in such a way that no leakage will take place, no matter what method we use. We should have confidence enough in our work not to be afraid of leakage. If we close the opening so there will not be any leakage, and wash the bowel off thoroughly when the infectious material is on the outside, there is no reason why that should be an infected spot. I feel strongly on this point.

As Dr. Allport has said, we learn by our mistakes. I lost a case by doing that. If there is any place where we would be justified in draining, it would be in typhoid ulcer. I closed it with Halsted suture, then, instead of having confidence, I carried a wick of gauze back on each side. About four months later the man came back here after having an obstructed bowel for five days, I operated and found gangrene and the patient died, simply because those two wicks of gauze going down on either side had caused adhesions at that point. If I had let it alone there is no reason why that man should have had narrowing of the lumen at that time.

I think the improved Fowler's position, or rather Fowler's position combined with saline, has been the cause of saving more lives than any other one point in technic in after treatment; it has been the greatest thing we have had in surgery in the past few years.

A *gall bladder* containing calculi may become infected from duodenum by way of the common and cystic ducts. So long as these channels remain unobstructed and the inflammatory fluids can freely drain away there is rarely much harm; but should a gall stone move into the cystic duct and block it, the inflammatory products no longer flow away but accumulate in and distend the gall bladder, and if the infecting microörganisms are of a virulent strain, the gall bladder will fall into a state of acute inflammation. Its walls become red, edematous, and quickly contract adhesions to surrounding structures, such as duodenum, colon, stomach, jejunum, omentum, or the anterior abdominal wall.—*Bland-Sutton.*

RESULTS IN TREATING COMPOUND COMMINUTED FRACTURES.*

D. G. MURRELL, M. D., PADUCAH, KY., ASSISTANT CHIEF SURGEON, I. C. RAILROAD.

Just about thirty years ago there came under my observation a case of injury, the result which, I doubt not, is the reason why there are a score of men walking on their real legs and using their natural arms today as useful members. The history of this case given from memory is as follows:

In 1878 a workman was resting upon his back, at the noon hour, in the shadow of a pile of pig iron in the yards of an iron industry at Louisville, Ky., when the pile of iron tumbled over on his legs, mashing and bruising the muscles and breaking the bones of both legs below the knees. A former injury to one of his limbs produced a talipes equinus on that side, and about the middle of this leg between knee and ankle, was a large indolent ulcer. The open sore and congested area comprised one-third of the space between the joints. This man was brought to the hospital and placed in the ward of which I was in charge as interne. His injuries from this falling pile of iron consisted of a comminuted fracture at the seat of the ulcer and a tearing loose of the soft parts from the os calcis, leaving the bone clean and the cup of skin and areolar tissue torn forward to the instep underneath. The heel bone, so to speak, was hulled out of the plantar tissues. The opposite leg had a compound fracture about the middle with the bone protruding through the skin over the shin. He was suffering from shock when brought in. Under the rules of the hospital no capital operation could be undertaken without the presence of a staff officer in charge of the ward. I sent for this surgeon; in the meantime, awaiting his arrival, I cleaned up the wounds and adjusted the fracture with temporary splints. The surgeon was not located and did not put in an appearance that afternoon; the next day he did not

*Read at first annual meeting Joint Association of Railway Surgeons, I. C., Y. & M. V., and I. S. Railroads, Memphis, Tenn., February 27, 28, 1908.

visit the house and the case was reported to another staff surgeon who was lecturing that day in the amphitheater of the hospital, who deferred the case. So, for one reason and another, it was passed until the fifth day after the accident, when the patient was put upon a litter and taken to the lecture room, for the first time coming under the observation of a staff officer, who, finding the symptoms favorable, declined to intervene.

To cut this story short, the patient went on to complete recovery of the fractures, the ulcer healed perfectly and there was improvement of the talipes equinus by the rough tenotomy of the tendon Achillis at its insertion. This man's wounds, considering the extensive bruising of the soft tissues with the compounding of the fractures, brought them well within the indications for amputation as the need was then believed and taught in such conditions. His recovery, to me, was a lesson of profound impression and one that made me dare to wait in a score of cases in the intervening years which seemed as bad, or worse, than the one briefly sketched, coming under my care, the records of some of which I will briefly recite. Cases beyond the ken of man to know what would be their termination, until time had demonstrated the result and proved that where there is circulation of blood in the extremity of the wounded limb, compound comminuted bone, lacerated and crushed muscles and torn cuticle should not deter a surgeon from an effort to save the limb if the surroundings are favorable.

The first case I will call your attention to was that of a fireman, C. H. P., 23 year old, injured January 7, 1898, near Scottsburg, Ky., by having his right arm caught between couplings, crushing it between elbow and shoulder. He was first seen by Dr. J. A. H. Miller of Princeton, Ky., who temporarily dressed the arm and sent him to the Paducah hospital, reporting the case as a compound comminuted fracture with considerable venous hemorrhage, further recording in his report the condition as a "very bad injury." Credit for saving this arm is largely due to Dr. J. Q. Taylor, my first assistant, who primarily saw this man. Through the open wounds about 2 inches of the humerus was taken out, including a part of the outer condyle. The cavities were packed with gauze. The circulation was good in the hand, the prime indication for non-amputation. The wound healed, the bone reproduced and later this man fired an engine on his regular run. There was less than ½ inch shortening, indicated only by measurement. He remained in the hospital 72 days. His temperature at no time was above 100.6, that only for two days, then his chart showed 1 degree for ten days, becoming normal and remaining so for the remainder of his stay.

Case 2.—D. W., colored brakeman, run over by a train at Covington, Tenn., August 29, 1899, was sent to the Paducah hospital by Fentress & Cooper, district attorneys, with the report that he had lost a leg. One or more wheels of a freight train passed over this man's right leg from the knee diagonally up the thigh, crushing the bone and bruising the muscles deeply, leaving the mark of the flange of the wheel plainly on the excoriated skin. A large hole was torn in the groin; the leg was greatly swollen; the groin wound did not involve the femoral artery, while occupying the space just over this vessel. The thigh bone, while considerably comminuted, was not exposed in any open wound of the lacerations and no bone was ever removed from this case. The foot was found warm, with circulation in the posterior tibial artery. The limb was cleansed, sutures placed where needed, cavities packed with bichlorid gauze in strips, the limb swathed in cotton and bandaged, surrounded by oil paper and placed between 6-inch sand bags on a firm bed. This man's temperature varied between 101½ and normal for 150 days, when he was discharged, January 26, 1900. The case was prolonged owing to a cold abscess in the gluteal region, which discharged quantities of broken down blood and serum. The femur united along the whole length greatly enlarged, but firm and functionating, and showed no defect to casual inspection. This man quit railroading and became a barber, his leg sustaining him with equal comfort and usefulness as the other at his trade, one requiring many hours upon his feet.

Case 3.—Ed M. S., white, 33 years old,

pumper at Little Cypress, Ky., injured by an explosion of the boiler. This case was first seen by Dr. R. M. Jones, who reported it November 28, 1900. Superficial scalds and compound comminuted fracture of the left leg 4 inches above the ankle. This man was brought to the hospital and the leg dressed and treated between sand bags. Over 2 inches of the tibia was removed through the wound made by the fractured bone; an irregular shaped piece of bone, comprising in its upper half the entire calibre of the bone, narrowing off spirally and then enlarging to about one-half the size of the bone, the whole being 2 inches in its entire length. A shorter fragment was removed, in shape reversed and not so long, fitting to the larger piece and completing the section of 2 inches of the tibia. Smaller fragments were cleaned out of the periosteum, which was left intact, with the exception of the lacerations occasioned by the fractured bone removed. The cavity was packed with strips of gauze and dressed antiseptically daily; at the end of 75 days this wound had healed and the man left on crutches. The periosteum filled with bone and the leg was stiff. He shows no lameness at this date, and in twelve months after injury he walked from Paducah, Ky., to his home at Little Cypress, about 10 miles, because of missing his train, and claims no inconvenience from the injury.

Case 4.—The report of this case, made by Dr. William L. Moore of White Plains, Ky., is as follows:

Andy K., colored, 28 years old, brakeman, on October 30th, 1906, was between cars coupling air hose when another train struck his, pushing it over him. Upper part of right humerus crushed and part of the bone protruding through skin, flesh very badly mashed and right hand smashed, with all the bones in the hand dislocated and flesh cut so we had to take 12 stitches. Left index finger cut off ½ inch from end, left thumb mashed, left leg had a hole in it 2 inches square, with about half the muscles on the inside cut in two. Considerable shock, with severe hemorrhage from right arm and left leg. Removed clots from wound in arm and leg, dressed and bandaged. Dressed hand and bandaged up arm and leg and both hands. Sent to the hospital on October 31, 1906.

This man came into the hospital still suffering from shock, with a thready pulse running over 120, the heart showing weakness for over 2 months, requiring stimulants and the application of hot bottles to the body and all the arts of skillful nursing to maintain life. The cavities of the compound fractured arm were packed after thorough irrigation and the muscular wounds of the right thigh were dressed open and packed. No effort was made to approximate the skin or muscles because of their great laceration.

The temperature commenced to rise November 2nd, up to which time it was normal. Indications of pus in the leg were recorded November 6th, temperature 100.6, and for three weeks pus was freely washed from the leg, the temperature indicating absorption, if not irrigated every few hours, fever running between 101 and 104, large pieces of tissue being removed at each dressing; and on the 17th day of November, eighteen days after the wounding of the muscles, the whole upper half of the sartorius muscle was pulled out of the wound. Pus cavities formed along the outer and under side of the thigh, requiring free incisions for their drainage.

On November 13th a spicula of bone was removed from the humerus. The arm and hand gave little trouble and showed a healthy condition throughout the progress of the case. This man remained in the hospital 126 days, when discharged, with the wounds all healed and walking without crutches. Knowing the sartorius muscle to be absent, I tested the action, and this man was able to cross his legs while seated, one over the other, with equal facility. On the 3rd of April, while turning in bed, he fractured the arm at the seat of injury and returned to the hospital and remained until June 6th, 1907, being discharged then with firm union.

Case 5.—M. H., reported by Drs. Bolton and Chambers July 12, 1907, colored brakeman, 24 years old. While uncoupling cars was caught between them. He stated: "My right breast being mashed, I became unconscious and knew nothing more." The doctors reported: On

right breast is a scar and bruise about the third or fourth rib, near sternum; right thigh is broken and mashed for all of lower third; left leg through knee and upper third of tibia, both being compound commiuted fractures. Shock and considerable hemorrhage. Treated for shock and both legs set and splinted and bandaged, wounds on both legs stitched and dressed by Drs. Bolton and Chambers and prepared to be sent to hospital, July 12, 1907.

The diagnosis was confirmed when this man was brought in. He was still suffering from shock, which continued throughout the first 10 days, requiring stimulants. The wounds were dressed with bichlorid gauze and he was put to bed with tin guitar-splints above and below the fractures; these were reinforced by sand bags for steadying the limbs. The remarkable recovery of this man without pus showing in the case is worthy of note. July 19th his temperature rose to 101, the highest temperature recorded; it was never above 99 after July 25th.

This case was typical of the position taken in the premises of this paper. Though all the lower third of the right thigh was broken and mashed and the left knee and head of the tibia fractured by the passage of the wheels of a freight car over them, they were saved, and the man received the benefit of waiting. The circulation was good in the extremities. There was little else to base a hope on, and the judgment of two of our excellent surgeons led them to the opinion that both of this man's legs should be amputated, which they expressed in a letter to me when the man was sent to the hospital. Taking these cases as examples, with similar ones to guide my actions for the *future,* where I find the blood supply fairly good beyond the seat of injury and the tissues reasonably connected, though bruised and mangled, I shall cleanse and bind and wait, with a hope sustained by the experience of the past.

DISCUSSION.

Dr. W. F. Grinstead, Cairo, Ill.: Papers like this always give rise to interesting as well as profitable discussion in an assembly of surgeons engaged in accidental surgery.

I can remember, gentlemen, when injuries such as have been reported in this paper were decided unhesitatingly to be beyond hope of relief by any other means than amputation. I can remember some men engaged in surgery before the days of antiseptics as we now use them, who seemed to be fond of showing how much of the human body they could lop off and not kill the man.

That practice has been absolutely reversed. The surgeon of today is proud of showing how much of the human body he can save and not kill the man—directly the opposite of the former practice. It is humiliating to the surgeon of today to be compelled to chop off an arm or a leg; he feels that it is a confession of limitation of his art, that he is not doing what the patient wants, what his friends want, and what the community wants. Therefore he exhausts every means of hanging on to an arm or a leg and saving it if possible.

The strongest reasons for amputation have almost vanished today. In pre-antiseptic surgery days, if we might use such a term as that, the surgeon was afraid to leave such mangled injuries as these because they would get full of pus, septicemia would result and a very large proportion of these patients would die. If he made amputation he had a clean-cut stump, he dressed it carefully and the chances were so far in favor of his patient living; and, after all, surgeons are exceedingly fond of live patients, even if they are a burden to themselves and to the community—if you can save his life you want to do it, and that is all right, too.

Now, when we are in doubt as to whether we can save an arm or a leg, we can clean it up thoroughly, we can insert the nozzle of our irrigator into all the pockets, we can introduce the fingers of our rubber-gloved hands between the fragments of bone, between the strings of muscle and integument, and we can wash out almost all the dirt and foreign matter present; we can apply an antiseptic, carefully adjust these injured structures (what is left of them) to their normal position as nearly as possible, infectious matter which might be overlooked can be rendered sterile by our antiseptics, which we inject into every groove and nook and pocket and corner of that limb; not only this, but we put drainage into these pockets, we use our medicated gauze and drainage tubes

so no accumulations can be retained to form grounds for germ proliferation.

With this sort of cleaning up, adjustment and disinfection, we can afford to wait a few days to determine whether there is vitality enough in that limb to escape gangrene, we can wait to see whether there are sufficient blood vessels left which are not lacerated, severed and disconnected, to sustain the vitality of that limb. I have often said to such patients, "Even if I save this limb I doubt if it will be worth much to you; you will be a cripple." But most any kind of a limb of one's own body is worth more than the best limb that can be applied by the instrument maker.

I further say that in the event the limb proves to be an incumbrance in any way an amputation can be made at any time to remove the useless portion of it and that such amputation can be made more safely then than at present. With the degree of safety we are enabled to throw around patients, and with the reward that we get as the result in many cases, there is no doubt but that the sugeon is justified in taking chances on what appears to be an almost hopeless injury, in order to see if the limb cannot be saved. If gangrene comes on, if he finds that the blood supply is cut off until the limb cannot be sustained, the patient by this time is so thoroughly sterilized that he is not infected and an amputation can be made more safely.

Dr. R. E. Fort, Nashville, Tenn.: With reference to the conservative treatment of compound fractures, it will be remembered that Dennis has collected the statistics of fractures occurring in Bellevue Hospital from 1870 to 1880 (or the pre-aseptic era), these cases including all compound fractures from the ankle to the hip and from the wrist to the shoulder. In those in which amputation was done the mortality was 40 per cent; in those in which an attempt was made to save the member the mortality was 45 per cent. This fearful mortality was the reason and extenuation for the great sacrifice of members by amputation which was resorted to at that time. At a subsequent period, from 1888 to 1895, or after the introduction of asepsis, a similar class of cases were collected from the same hospital. In this series there were very few amputations and the mortality was 1.5 per cent. I do not believe there is any department in the entire domain of surgery where the evolution of asepsis has accomplished so much, with the possible exception of the sacred confines of the abdominal cavity.

The serious obstacle which confronts the railroad surgeon is the fact that in compound fractures, and all other conditions, infection has taken place before they get into our hands, and it is for this reason that it is essential for us to give so much consideration to drainage. I regard the three most important considerations to be: first, drainage; second, the constant application of artificial heat; third, immobilization.

With reference to drainage, it must be considered that as a rule the vulnerating force is from the front, therefor a large majority of wounds in compound fractures are on the anterior surface of the limb. And recognizing the great importance of gravity in drainage, it is my custom to institute through-and-through drainage. This is accomplished with a Mikulicz drain.

Artificial heat is accomplished by encasing the limb below the wound in cotton in which oil remains and applying hot water bags over this.

With reference to immobilization. Of course, the particular method depends upon the location of the fracture. All detached fragments should be removed and all periosteum which is not detached should be saved, and in a fair majority of compound fractures I believe wiring has its most valued field of usefulness.

This paper, in my opinion, should be fully discussed ,both because of the frequency of the condition and the immense benefit the proper consideration of the subject yields to humanity.

Dr. J. R. Sanford, Covington, Tenn.: In regard to the Walker case, described by Dr. Murrell, I attended the patient in the first instance, finally sending him to Paducah with instructions that the leg be amputated, and I never was more surprised in my life than I was about a year afterward, when Dr. Murrell told me that the leg was all right. I want to ask Dr. Murrell what the condition of the patient was when he was sent to the hospital?

Dr. Murrell: I might say, Dr. Sanford, that I think the results were due to the good work you did in the beginning.

Dr. Sanford (continuing): I gave him strychnin and half a pint of whisky (laughter and applause), for profound shock, as I supposed, and I thought that was the best way to treat him. You recollect I put his leg in a felt splint, dipping the material in hot water, and molded it to his leg; and he got well in good shape, I believe?

Dr. Murrell: Yes, sir.

Dr. L. Sexton, New Orleans, La.: I think a point equally as important as that of drainage would be to keep the limb absolutely warm. Death of the part means stagnation of the blood, or vice versa. The majority of these compound fractures are treated by some hot application of bichlorid or carbolic acid, and I think it important that the limb be kept warm by keeping hot bottles around it. In cold climates a wet cloth put upon an extremity where death of the tissue is a problem may make the limb cold, and during the night stagnation or lack of circulation may cause death of the part. The warm drip is very easily kept up by an alcohol lamp under a little enamel irrigator with a syphon draining out—if this warm drip is kept on that wound it carries out septic material, keeps the capillary circulation open and prevents that stagnation with molecular death of the part, which is so apt to take place in the case of the small fragments of the bone and soft parts.

Another important point is never to sacrifice any periosteum. You may take out all the fragments of bone if necessary, but if anything is hanging by one little shred of periosteum leave it in place, because it is by means of the periosteal osteoblasts that a final hardening of the bone takes place. Therefore we may remove particles of bone from which all periosteum has been removed, as if left they might act as a foreign substance; but if there is any periosteum connected with these fragments, try and save them. That and warmth to the extremity are certainly as important as the matter of drainage.

Dr. H. C. Fairbrother, East St. Louis, Ill.: Just a word upon the subject of early cleansing of open wounds. An article appears in THE RAILWAY SURGICAL JOURNAL which was, I believe read at a meeting of railway surgeons in Chicago, opposing early cleansing. It was a well-written article, and following its reading no remarks were made in opposition to the view expressed that no cleansing of open injuries should be done in the beginning, simply applying aseptic gauze, cotton, etc., for the first dressing. The doctrine is not limited to that gentleman, for quite a number of good surgeons have adopted that practice. The teacher of clinical surgery in the St. Louis University advocates that doctrine. I rise to register my voice and opinion against it, and in favor of the plan followed in the paper just read and so ably advocated by Dr. Grinstead. From my experience in such cases I consider that thorough, early cleansing is the only proper method.

Dr. I. F. Firebaugh, Robinson, Ill.: When these injuries to the leg occur there is, of course, hemorrhage, and the men apply a tourniquet. I saw a leg terribly injured by the use of a tourniquet made of a strip of cloth and a long bow. The view I have gained in experiences during the last two years is that the injury made by the tourniquet is in some cases pretty nearly as bad as the original injury.

I was very much pleased with the doctor's paper, and I have seen it illustrated several times in my experience. Away back in 1880 I had a case of compound fracture with dislocation of the ankle joint. The man jumped from the top of a railroad car which in backing along had run off the track. I cleaned it up with water, put a finger in the wound, pulled the skin down over the point of the bone, put it back and dressed it as well as I could. I wanted to cut the point of the bone off, but he would not have it done. I read up on the subject and found that the opinion of some authorities was that it should be cut off, and then I had a chill. I did not cut it off, however, but went ahead with it and made him a good foot.

Within the last two years I had a case in which one leg was so mashed that there was no hope for it at all, and the wheel had passed over the other foot. I amputated the right leg below the knee, and I thought I would leave the

other until the next day or some other time. I was doing first rate and I put the operation off until the next day, when it was found to be doing all right and I again put it off, and it has been doing well ever since. It healed without any trouble and the man is going around on it.

Dr. J. P. Lord, Omaha, Neb.: In the matter of excision of fragments and the amount of shortening which can be resorted to, there is a division of authority. I found in a case of very extensive comminution of the femur that 2 inches of comminution was as much as I could get authority for in trying to save the limb; that is, if there was more than 2 inches, the text books said to amputate. I thought that any shortening we could make here that would serve to give us a limb, would be better than an artificial one and would be justifiable. Therefore I removed, because of necessity, 6 inches of comminuted fragments from the middle third of the femur, and secured a good result. This, as you may imagine, was rather a difficult procedure, because in dealing with the mid-portion of the thigh in a muscular man, the amount of contraction necessitated by this so enormously increases the circumference of the limb that closure of the wound is, of course, impossible at the beginning. The result was satisfactory, however, and the function was good. I relate this case simply to show that we must not be bound by text-book authority necessarily; I think that we can use our ingenuity and common sense in accomplishing things and making an authority of our own.

My paper is practically a clinical record of certain cases that have through the years come to the hospital of which I have had charge, and I have brought them before you for the purpose of illustrating how severely a man can be injured and still make a good recovery, and to indicate that we should not, therefore, be too quick in advocating destroying the limb.

Dr. Murrell (closing): Gentlemen: I am in the position of the lady who secured a divorce from her husband because he would never quarrel with her.

There were two or three points in Dr. Crook's paper, presented yesterday, in which I was very much interested. One or two points that have been brought out today also have specially interested me, and one is that in cases of comminution, where the periosteum is intact, if we can hull out these small fragments that would die for want of circulation, we will have regeneration of bony tissue. In doing this, I pack the cavity just as I would any other cavity, and, if done antiseptically and there is sufficient life in the part to enable it to live at all, it will, I believe, reproduce its bone and we will prevent the shortening produced by cutting off and wiring the bone. In the case about 2 inches of the humerus and a part of the outer condyle was removed. That cavity was packed, and, as reported in the paper, there was less than ½ inch shortening. He could put his hands together, his arms in about that position (arms close together). In Case 3 fully 2 inches of bone was removed, and this cavity was packed.

Another point that has been thoroughly fixed in my mind, which I practice and expect to continue to practice, is the following: In these cases of crushed limbs, when I have the wound thoroughly cleansed and dressed and the patient on a firm bed, I use 6-inch sandbags, well molded into the undulations and around the tuberosities of the joint, which, I believe, gives all the extension that Nature gives with the bone on the inside. Men differ as to extension and means of accomplishing it, but I believe there is no reason on earth why a man should be put to the torture of a weight falling over the foot of the bed, or any other mode of extension. If you will pull the limb out, see that it is the same length as the other, and pack the sandbags thoroughly around the leg, it will remain as it is. It is so heavy he cannot move it. With these sandbags around you have the first requisite of a cure—rest; he gets easy and will not attempt to move it, and I think that I have by this means secured as good results as I know of in the statistics. I make my extension when I put the bags around, hold the limb myself, set it and get it straight, my assistant and nurses packing it in; I leave it in that position and it will remain so.

There is just one other point in surgery to which I wish to refer: I have found that pus is not an element of great danger unless it is

not drained. Sac-pus is dangerous, but if you have drainage it will be all right, and if I were talking to a younger man and it was the last word I would say as to surgery of this character, it would be, drainage and free drainage. If we get that, Nature will do the rest.

OPERATIONS IN SHOCK.*

W. F. GRINSTEAD, M. D., CAIRO, ILL.
District Surgeon Illinois Central System.

The constantly recurring problems of operations in shock, in accidental surgery, is sufficient justification for its presentation to assemblies of railway surgeons at frequent intervals. The temptation to operate at once, when it is beyond question that operation is inevitable in the end, is very strong. The surgeon must admit to the relatives and friends that the patient cannot escape operation if he lives. With this admission, the feeling in the minds of those most interested is that the operation would probably add safety to the alarming condition.

I am reminded of a recent occurrence at St. Mary's Infirmary, Cairo, when a switchman, desperately crushed, was brought by a local surgeon from a neighboring town for hospital treatment. The patient was immediately conveyed to the operating room where we stripped him for a physical examination of his entire body. After we had gone over him with great care we returned to the consulting room, where I insisted that we must not operate, notwithstanding a thigh was hopelessly crushed. I argued that the man was profoundly shocked and I believed had a fatal injury. Operation, in my judgment, would only hurry him off. I declined to operate. The local surgeon, who was a competent man and who had a warm personal interest in the patient, aside from the purely surgical principles involved, said: "Doctor, where I live, I would be almost compelled to amputate that limb to protect myself from the urgent and unanimous clamor of his friends who would insist that I was standing idly by and permitting him to die without giving him the only chance there was for him." This case brought out another point in accidental surgery: The patient had not been completely stripped to look for other than the most apparent injury. Evidence was found of injury to the trunk, the effect of which could not be definitely estimated. The man died during the day.

Let us use this case as a further example: To have operated would have worked two injuries—First, the fatal issue would have been hastened; second, there would have lingered in the minds of some persons a belief that the operation killed him. An experience of a quarter of a century in railway surgery has taught me that in all cases of accidental injuries, except the most trifling and self-evident, the entire body of the patient should be examined. A patient often has injuries that he has no knowledge of immediately after the accident. I once knew a competent surgeon to overlook a broken leg (one bone) which was overshadowed by a more severe injury. He was surprised and chagrined a week later to discover the fracture on complaint of soreness by the patient. A careful examination of all the limbs as well as the trunk will sometimes prevent operations in shock by revealing a fatal injury which might have escaped attention. Furthermore, it is quite embarrassing to be asked on the witness stand, in a personal injury suit, why you did not examine the patient to learn the extent and location of his injuries, and have no better answer than to say that the patient did not tell you he was injured in more than one place.

I do not believe I could interest this assembly by a discussion of the definition of shock, because the masters in surgery are divided on this point. The diagnosis of shock is inseparable from the consideration of any feature of the subject. The phenomena of injuries most likely to confuse or lead the surgeon astray are concussion of the brain, syncope and hemorrhage. Concussion may be distinguished by the immediate supervention of unconsciousness and by the slow full regular pulse.

Syncope may be differentiated by the degree and short duration of the mental lapse and circulatory disturbance, together with its causes.

*Read at first annual meeting Joint Association of Railway Surgeons of the I. C., Y. & M. V., and I. S. Railroads, Memphis, Tenn., February 27, 28, 1908.

Syncope is produced by strong mental impressions, by severe physical effort, by pain and hemorrhage.

Shock may be distinguished from loss of blood by the discovery of the latter, which is sometimes obscure, and by the immediate onset of the symptoms of shock. The symptoms of hemorrhage are delayed. If the symptoms of shock subside, only to recur a little later, we should always suspect hemorrhage.

That the majority of surgeons do not approve of operations in shock is probably true; and yet, I have operated in shock with most gratifying results. If you have a crushed limb which is causing hemorrhage and great pain, and the pain is increased by tightening the tourniquet till the patient howls and begs for relief; and, furthermore, if careful examination reveals no serious injury elsewhere, I believe you are more likely to improve the shock by operation which stops the hemorrhage and removes the pain, with its depressing reflex irritation, than you are to increase it.

I recall one case, however, in which I followed this doctrine and regretted it. A limb was hopelessly mangled by a car wheel. The oozing was difficult to control. The shock was severe, though not extreme. I decided to amputate at once and started preparations. When I was nearly ready the anesthetic was started. While transferring my instruments from the sterilizer to the tray, my anesthetizer announced that the patient had ceased breathing. Everybody hurried to him, his head was lowered, the body elevated and artificial respiration worked thoroughly for a long time, but he never breathed again. To this day I do not know whether the patient died from the anesthetic or from shock. My anesthetizer declared positively that he only took a few whiffs of the anesthetic and not enough to kill anybody. My own feeling is that the fatal issue should be charged to the anesthetic. While, as stated above, I have operated many times in shock, this is the only instance in which I seriously questioned the propriety of it.

The opposite extreme is well represented in the case of a brakeman who had his foot caught in a frog and his leg and thigh crushed to the middle of the latter. He was severely shocked. His face had a deathly pallor and his pulse ran about 140. I amputated immediately at about 5 inches below the trochanter. At the end of the operation he was in better condition than when he was put on the table and he made a good recovery.

If operation in shock is to be executed, one cannot be too careful in excluding other injuries than the one demanding operative treatment. An obscure internal injury may put the question of anesthesia or an amputation out of consideration. My feeling has been, for a long time, that operations in shock should be undertaken only in uncomplicated injuries of the extremities. If one or more extremities are hopelessly crushed, if the oozing and pain are exhausting; if the necessary pressure by tourniquet to control hemorrhage, increases the pain beyond endurance, requiring large doses of opium; if hemorrhage has already been free and this strong pressure by tourniquet will increase the danger of slough in your stump, I believe the surgeon will often be justified in executing a rapid amputation under ether anesthesia, in shock.

Conclusion:

1. Shock should be carefully differentiated from concussion and syncope.

2. It should not be confused with the symptoms of hemorrhage which so closely resemble those of shock.

3. Before attempting any operation in shock, a careful examination should be made of the head, chest, abdomen and pelvis for obscure injuries which might contraindicate, absolutely, any attempt at operation.

4. When the injury or injuries are limited to the extremities, and the resulting hemorrhage is not considered dangerous, of itself, operation is often justified in shock.

5. The advantages from operations in shock are (a) prompt control of hemorrhage; (b) relief from pain incident to the injury and the pressure of the tourniquet; (c) they minimize the danger of slough from cutting off the blood supply by tourniquet; (d) protection against infection.

DISCUSSION.

Dr. E. J. Johnson, Yazoo City, Miss.: I want to express my keen appreciation of Dr. Grinstead's most excellent paper. Shock is a matter of considerable concern to all of us, and the essayist has brought out very clearly the most important points pertaining to it.

I heartily agree with the Doctor as to the time of operating in these cases. I think we can hardly place too much stress on the importance of being careful as to what we do until we know the general condition of the patient by examination of the cranial, thoracic and abdominal cavities, etc. When we are convinced that the condition is not due to concussion or compression, that it is exclusively shock, especially where there is much exposed nerve tissue, for instance, in laceration of the extremities, where we know the shock is profound and will be continually so, I think we should do the surgical work necessary as soon as possible. I advocate the idea of a great deal of heat.

I recently had to do a double amputation, the patient profoundly shocked, and I had the operating-room heated to 100°. This was uncomfortable for the attendants, but it did not matter—it is for the care of the unfortunate that we are working. Keep them as hot as you can; they are much depressed by the exposure of the nerve tissue and the damage to the central nervous system, and, as one gentleman has said here, by the pain and tension produced by the application of the tourniquet; and in my opinion waiting for the so-called "coming out" from under shock only adds to the gravity of the condition. I have never yet seen a case in which amputation was delayed 24 to 48 hours for the purpose of allowing the patient time in which to get over the effect of shock, that was not finally operated on in greater shock, and these patients invariably die. In the last two years I have had occasion to do two double amputations, and I would say that both patients have recovered. I amputated as soon as I could get the patients in a room having a proper degree of heat.

In regard to the tourniquet, I think we sometimes make the mistake of applying the tourniquet too far away, and we also sometimes put it on too tightly and thus traumatize the tissues. The destructive action on capillary, blood-vessel and nerve tissue as the result of actual contact with the wheel of a moving locomotive or car, is very great. Apply the tourniquet as near the site of the injury as possible. If I get to the patient I do not put on any at all, but apply a forceps instead.

I am a great advocate of the normal saline solution, which I use a great deal. As soon as I have completed the amputation I have the patient carried to a room having a temperature of 100°, keeping him there until the body temperature has gone up and he is out of shock. Also right after operation I begin the injection of dripped black coffee with saline into the rectum. You can add any of the nutritives if you wish and feed the patient in that way. I like this, for I have derived considerable benefit from it.

Dr. C. S. Stewart, Amite, La.: I have listened with much interest to the numerous papers presented here, but find that most of them are intended for those who have all the surroundings favorable, the facilities for operating present, and not for the unfortunate local surgeons.

I am sure that the greater number whom I am addressing are like myself—they have none of these surroundings and facilities, and have had cases in which it has been necessary to operate with only the surroundings that are present under the most ordinary circumstances, possibly a case suffering from profound shock and hemorrhage and all the terrible accompaniments of a serious railway accident, and no one present except the patient and yourself, your surroundings the four walls of the station where perchance he has been taken and the bare floor he is lying on. What are you going to do? Your patient is bleeding profusely, he is suffering agony, and yet you have to do for him in spite of these surroundings. This is a case where you have to consult the surroundings and do just what is before you. I recall a case where I had the depot platform for my surroundings, the time about 3 o'clock in the morning, the lamp out of the railroad office for my light, and no one present except myself and the patient, who was suffering from shock, from

hemorrhage, from pain, and there the amputation had to be performed.

The railway surgeon has to confront a great many difficulties of that sort; he has to consult the welfare of his patient and adapt himself to his surroundings. Therefore the question of shock is a very uncertain one; we do not know just exactly the effect it is going to have on the system; we cannot figure out just how much damage is being done to the patient, and whether this condition of shock is one that will be easily relieved or will be best removed by restoring the patient to a comfortable condition. My plan has always been to give the patient a reasonable time in which to rally from shock when I could, and when I could not to put him in the best possible condition for hearing and when I have done this I have had no occasion to regret it.

Dr. L. Sexton, New Orleans, La.: There is one point I wish to refer to. In a case where the leg was crushed off by a car-wheel passing over it, and the arteries cut off, I have seen the popliteal throbbing synchronously with the heart beat. In a condition of that kind, where traumatic amputation has already occurred, if you ligate the vessels already exposed and with an ordinary pair of scissors finish the amputation by cutting the shreds and little muscles not already severed, give intravenous infusions or hypodermoclysis, administer morphin 1/8 grain, repeated if necessary (which is the best stimulant and relief to the sensory nerve filaments), this is an ideal way in which to attend to these cases. It is the sawing of the bone in major surgery, the patient already shocked, which increases the shock. But if the case is in the condition of collapse described, you can temporarily relieve the condition by getting rid of the crushed member in that way. Control the pain over the sensory nerve filaments by minute, repeated doses of morphin, keep the patient warm, as Dr. Johnson has suggested, and give intravenous infusion or hypodermoclysis of salines, being sure the blood-vessels are secured, by these means giving your patient the best chance of recovery. Then to amputate in future is all right.

You will all remember that our textbook instruction in regard to shock often is to give hypodermics of nitroglycerin, strychnin, or digitalis. Crile in his experiments, which are very characteristic and instructive, has demonstrated that these vasomotor constrictors do harm and bring about increased shock. I really believe that our very best remedy consists in minute doses of morphin, often repeated, just enough to keep up stimulation. The coffee-drip I like also. Very often we get along without the tourniquet, and we can temporize with the patient, not doing the final operation until he has sufficiently recovered. In that way our mortality will be very much less and the results satisfactory to ourselves and to the patient.

Dr. C. F. Smith, Kankakee, Ill.: The paper was certainly an excellent one and brought out a good many very useful points. The one which interested me most was in regard to the use of the tourniquet. I believe that a great deal of harm may be done by applying the tourniquet too tight. I have seen one case in which a second amputation had to be done, I am sure on account of the use of the tourniquet, and, as the Doctor suggests, if you can get along without its use at all, it is better. But if you use it, before closing the wound entirely let me suggest that after removing the tourniquet you get all of the clots possible out of the limb. When you put the tourniquet on, whether you put it close to the wound or higher up, you are going to have an engorged condition of the superficial vessels of that limb, therefore by all means relieve this by stripping the limb down and emptying the blood-vessels before you suture the flaps or close the wound, thus establishing circulation in the superficial blood-vessels, when the wound will heal much better.

In regard to solutions of saline coffee, I have never used it, but think I will try it when occasion arises.

All in all, we cannot always wait for shock to pass off. If we do, the patient may pass off before the shock does. If you have a lot of exposed nerves, a source of irritation, and hemorrhage, there is one of two things you must do: Either ligate those bleeding vessels or put on the tourniquet. I am very much afraid of a tourniquet of any form or description. A very small amount of the anesthetic will so anesthetize the patient that, if you work rapidly,

you can complete the operation almost as quickly as you could go down and hunt up the bleeding vessels and ligate. Unless we believe the man would die upon the table, I think, Gentlemen, that we should operate just as soon as we can after the patient is brought into the hospital.

Dr. W. H. Wilder, Birmingham, Ala.: One point that was brought out by Dr. Sexton I wish to emphasize, and that is that in my experience heat and morphin have done more good for the relief of these conditions than anything else that I have tried. It is true, I have been adhering to the old school of using the vasomotor stimulants in conjunction with morphin, and I think I will have to continue them a little longer, notwithstanding the experiments of Dr. Crile. If we have a larger amount of blood brought to the heart because of constricted blood-vessels whereby we are able to tone up pressure, I think we do a great deal to overcome shock. I would also give morphin, and of the vasomotor stimulants I prefer strychnin to atropin as commonly given on account of the after-effects that we have.

There is one thing that I do want to condemn very emphatically, and that is the giving of nitroglycerin in those conditions. Nitroglycerin is, as has been stated here, often mentioned as one of the heart stimulants. It is true that this drug does stimulate the heart muscle itself, but if you will recall your materia medica and therapeutics for a moment, you will remember that it at the same time dilates the capillaries and consequently lowers the blood pressure, and therefore adds to the shock that you already have instead of lessening it—in other words, adding fuel to the flame.

I have never tried coffee by rectum, but think it a good idea, as caffein is certainly a good heart stimulant and to a certain extent it is a vasomotor stimulant at the same time.

I want to thank Dr. Grinstead for this excellent paper. It is one of the most timely subjects we as railway surgeons have to deal with, and he has taken a very conservative position in regard to it, and if we adhere to his suggestions we will all, I am sure, be benefited thereby.

Dr. O. A. Hall, Webster City, Iowa: In considering a question of as much importance as this, it is not out of place to remark that shock may be classified under three heads: Mild, severe, and profound. The first two are the conditions presenting themselves for successful operation immediately after the receipt of the injury. If when the patient comes into the hands of the surgeon the pulse is moderately good and the skin not very cold, if the respiration is not too much labored, it is safe to say that the patient can bear the anesthetic and the operation.

In an extensive experience during the Civil War, when hundreds of cases were amputated on the battle field where we could not wait for reaction, it was the custom in those days to administer ¼ grain of morphin, sometimes as much as ½ grain, then wait a short time, place the patient under the influence of chloroform (that was before the days of sulphuric ether), and if reaction came on, which did in nine cases out of ten, the operation was proceeded with. If the patient reacted under the influence of chloroform it was safe to operate. There were some cases that did not react, and, of course, they were taken off the table. I can recall but one case that died after chloroform was administered. A patient in extreme shock, in fact his case was regarded as so serious that the chloroform was administered to see if reaction would take place, but he died on the table. Both legs had been carried away by a cannon-ball and the hemorrhage that succeeded had almost destroyed his life before he reached our hands.

As stated at the beginning, shock occurring in the first and second classifications is of that nature that reaction will follow under the use of the anesthetic. In shock under the third classification I should hesitate to operate until some reaction had shown itself.

While all of you have doubtless operated on patients in varying degrees of shock, perhaps none of you have ever experienced the sensation of a patient in shock. It has been my misfortune to experience this, and I know of nothing that will make one feel so near the border line of dissolution as the feeling of shock; he knows nothing when it comes, but

he certainly knows when it leaves him, and I deeply sympathize with those who are injured and feeling the influence of this condition.

Dr. G. F. Holland, Bloomington, Ind.: It has occurred to me that we might get an expression of opinion from Dr. Grinstead and from others as regards the degree of shock present in the varying conditions of intelligence and physique of patients. In my experience I have found that most of my patients of the lower grades of intelligence react when those of higher sensibilities would fail to react under the influence of the anesthetic. I am referring chiefly to those of the foreign population having a lower order of intelligence. The degree of shock would, of course, govern one as to whether he will proceed at once or wait for shock to pass.

I thoroughly concur with the seemingly universal opinion that hemorrhage should be stopped by all means by other agencies than the tourniquet. The old-fashioned tourniquet did more damage than the modern one, that having direct pressure being preferable. As a temporary means, to twist the artery or tie off the bleeding point would give immediate relief if the patient comes into the hands of a surgeon. We can expect nothing better than the Spanish windlass from the ordinary "first aid."

I remember a case recently brought to me with legs crushed off, fractured ribs, injuries of the head, but without sufficient unconsciousness to ease pain, in which the patient had been given almost a full grain of morphin within two hours, and for relief of the pain produced by the tourniquet only, because as quick as this was removed the bleeding ceased, the patient was comfortable and soon reacted; but as soon as the temporary double amputation was done by a synchronous operation in order to lessen the time, the patient went into shock and lived only two hours, when he had shown all the signs of reaction. I have never been able to explain to my own satisfaction why he did this, except that it was due to the reaction from the effects of excessive doses of morphin. I think, therefore, that the small doses are better than the larger ones.

Dr. I. F. Firebaugh, Robinson, Ill.: Blood will run down hill the same as water. In an ordinary case of hemorrhage where there is oozing, the best plan is to elevate the limb. Of course, if you cannot do this, use a tourniquet; take up the vessel, or do something to stop it; but if the wound is in any part of a limb the hemorrhage will cease if the limb is raised. The heart will force the blood into the lower part first, and if hemorrhage is not severe this will check it.

Referring to the remarks of Dr. Stewart, surgery was done before hospitals were ever thought of. The elements required are cleanliness, and a man who knows how to take advantage of everything that he has, who has been pressed to do these things because he has no one with whom to consult and has learned to make the best of the situation. In a year's experience in one of the large hospitals, I saw the patients come in, saw them die by the dozen, and when I went out to a country practice I at first would say to myself: "This man will die, That man will die, This child will die," but they recovered, simply because they had the fresh air of the country. That is a great thing and often will help a patient who, were he in a hospital of one of the large cities, where ventilation is not always good, would not get along because of just the difference that breaks the camel's back.

Dr. Grinstead (closing): There are two points I wanted especially to emphasize in connection with this subject:

First, we should determine carefully whether there are other injuries than those to the extremities. Examine carefully the head, chest, abdomen and pelvis and see that you have not injuries there that are necessarily fatal. It is so easy to overlook that point, and I have seen it overlooked by men of ability. A patient may not complain of any injury other than that to his extremity, when possibly he has a fatal internal injury and which may be hard to find even after you look for it, there may not be much external evidence, but there is internal injury of a serious character. If you suspect

serious internal injury, you would best not operate, wait and see if he is going to rally.

Second, the feature of hemorrhage in those cases. If your patient has bled to death, why, let him alone. He will lose a few more drops of blood any way you fix him in an operation, he possibly has no chance to live, and you had better let him die from his injuries than to feel yourself that possibly your operation hurried him off, and have the science of surgery suffer in the esteem of the public by a suspicion that "the doctor killed him." We must protect the reputation of surgery where we can do it and do our duty otherwise. We owe our first duty, Gentlemen, to our patient above everything else, but we must look for those two things in severe shock. If the hemorrhage has not been excessive, and if there is no internal injury, you do not need to be afraid to make a double amputation on these patients.

Dr. Firebaugh: What anesthetic was administered in the case which died?

Dr. Grinstead: Chloroform. This has been the means of getting me away from chloroform. I do not think I have given it half a dozen times in two years. I have learned to give ether by the drop method, and patients take it just about as quietly as chloroform if a man knows how to give it, and I believe it is much safer.

Some one mentions opium for the relief of pain in these cases. The teaching by some of our best surgeons, surgeons whom we consider as authority on this subject, is that patients in shock do not stand opium very well, if we give it at all we must give it sparingly—that is the consensus of opinion. Did time permit, I could quote a few of them that are outspoken on the subject.

With reference to coffee, I would like to say that Dr. Johnson of Yazoo City is a close personal friend of mine and he knows I wouldn't say anything that I thought would shock his sensitive nerves; but I think he will pardon me when I say that this use of coffee has probably grown out of the prohibition wave that has recently swept over the south like a cyclone.

FRACTURE OF THE NECK OF THE FEMUR, WITH REPORT OF THREE CASES.*

E. S. M'DONALD, M. D., CAMERON, MO.

After the splendid lecture and demonstration of the Maxwell-Ruth method yesterday, it seems that very little of interest could be added. That was a most excellent lecture and very helpful to everyone present, I am sure. And it is an excellent apparatus. To be sure we have a great many appliances, and it is gratifying to the surgeon to know that with a very inadequate appliance sometimes we get very good results. But it is to be regretted that sometimes with the best appliances we get a very bad result. But this is more of an exhortation to take care of these old people, especially as I have in mind one patient who remained in bed for eight years after the fracture occurred.

The subject of this paper is as old as the anatomy of the human body, for it is evident that the structural elements of which the tissues of the body are formed are the same and in no way differ from that of which the first man, Adam, was made, away back in the dawn of creation, when the first great surgical triumph was enacted and recorded in holy writ, without scalpel or anesthetic "did the Lord God cause a deep sleep to fall upon Adam, and he slept, and he took one of his ribs and closed up the flesh instead thereof." From this remote period, e'en "before the morning stars sang together," do we get our histologic data, the primary chemical elements, all or a part of which, enter into the formation of every tissue and substance of the human body. At no time in the history of man has immunity from the liability to accident been afforded. Then it must have been that the subject of this paper, "Fracture of the Neck of the Femur," was an accident common to all peoples in all ages, and while the conditions predisposing to it, that of senile rarefaction, which begins early in the latter half of life, was not understood, even by the mythologic Æsculapius, to whom was

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

imputed the power of restoring life to one who had been torn to pieces.

So much has been written within the last half century by men who are eminent in the domain of surgery that it does seem there is nothing of interest left to be said. However, as surgery is a progressive science, it will not do to accept the teaching in toto, even of the past decade—and right here is where I wish to say that the traditional idea or teaching that a fracture of the neck of the femur in the aged will not unite is erroneous, and much harm has been done to this unfortunate class of patients by its acceptance.

Fracture of the neck of the femur is strikingly more frequent in elderly people than in the young and middle-aged, and is the result many times of a very slight degree of violence or force, as a fall, a misstep or the effort to avoid a fall. We occasionally hear this statement: "Mrs. A. fell while walking across the floor and broke her hip." It is most likely that Mrs. A. broke her hip while walking across the floor, and fell.

The classification into intra- and extra-capsular fracture has never been satisfactory, as it took no account of the "mixed" fractures where the line is partly within and partly without the capsule, which should be designated as fractures at the base and fractures at the apex or the neck. In a fracture of the small part of the neck or apex, it will be noticed that the fracture crosses the neck transversely or obliquely, and with but little harm to the periosteum, and is seldom impacted. In or under this classification will be seen an occasional separation of the epiphysis. In fracture at the base, which is a more frequent accident, the line of fracture will be seen more uniformly at the junction of the neck and shaft and may extend through the greater trochanter. The most potent factor in this bone lesion is senile atrophy rather than a diminution of animal constituents.

The diagnosis of fracture of the neck of the femur can best be made by a careful study of the history and the symptoms. If there is pain, loss of function, which is common in both varieties, unusual mobility, together with deformity, which is always present, and a sense of grating or crepitation which can be elicited by manipulation, except in cases of impaction, it is certain that a fracture is present. When a case is obscure it becomes necessary to take the measurement, and great care must be taken to place the limbs symmetrically with reference to the pelvis, not forgetting that previous injury or disease may have affected the length of either limb and that there is a normal inequality existing in many people. This can best be accomplished by drawing a line across the abdomen, striking the site of the spines, then measuring from a fixed point, say the inner malleolus to the line at the superior spinous process, comparing both sides, when it will be seen that the injured limb is from ½ to 2 inches shorter than its fellow. All unnecessary manipulation for the purpose of eliciting crepitus should be avoided, especially where any considerable degree of force or prolonged effort is necessary in this form of fracture. Better ignore symptoms, or rather, take for granted that which you have reason to believe, than to lacerate the periosteum or liberate an impacted fracture, thereby causing greater deformity as a result. In case of doubt as to the diagnosis, if the patient be an elderly person complaining of pain at the hip with loss of function of the limb, immediately after a fall or a violent blow as the kick of a horse or other direct force applied about the region of the hip, a fracture is probable and should be so treated for a fortnight or three weeks, when the conditions will have so changed as to clear the diagnosis.

The deformity or displacement occurring in these fractures is due to the action of certain muscles after the separation of the fragments—viz., the glutei, pectineus, adductors, as well as the psoas, iliacus, and obturator externus. One of the most striking deformities is the characteristic eversion which is not infrequently confounded with an upward and forward dislocation of the hip. The time is too short to enter upon the etiology of fractures, therefore I will only mention the causes predisposing to the fracture of the neck of the femur in old age, namely, such as affect the shape, structure and function of the bone, and the modification produced by advancing years.

In mentioning the treatment I wish to report three cases of the above named fracture in elderly persons. I have selected this special class of fracture for the reason that, occurring as it does in old age most frequently by reason of its predisposition, together with the too commonly accepted theory or belief that it cannot be successfully treated, that others may be induced to at least give the patient the benefit of the doubt, together with the best efforts and appliances possible to restore the function of the limb.

Case 1, Male, aged 69; history negative; fracture of neck of left femur. In this case I had the counsel of two other surgeons, both of whom declared union impossible under the circumstances. The patient resided 4 miles in the country with very bad environments. The services of a nurse without compensation or place to sleep were impossible. This situation was anything but inviting, and I took the case with a perfect understanding that I was to be relieved of any liability as to the issue. With the assistance of consultant, I put the patient on a hard mattress with broad board extending from head to foot of bed to prevent sagging. After reducing the fracture, the combination of Buck's extension and Hamilton's long splint was applied with extension weight of 8 pounds. The foot of the bed was elevated 6 inches, making the patient's body the counter-extending force. Special attention was given to securing comfort and nourishment, and no amount of water was allowed about the patient's hips, which were kept clean and dry by his faithful companion and wife. With a broad strip placed above the fracture and around the body the patient was lifted by an assistant on either side just enough to allow the open hand moistened with equal parts of alcohol and water, which was applied from time to time and the skin well rubbed. Two sand bags were placed on either side to prevent change of position, or rather to insure immobilization. No change was made except in extension weight which was reduced to 5 pounds at the end of the third week. The patient maintained this position for seven weeks, when the splints were removed and he was allowed to sit in a chair. At the end of the ninth week, he went on crutches for a time, and as soon as bony union was assured, he put by his crutches and walked with a cane, and has since his recovery walked to town, a distance of 4 miles and carried a basket of eggs on his arm.

The point I wish to make in this case is that the maintenance of the fragments in apposition is paramount. If that can be done the result will be bony instead of fibrous union in nearly every case without reference to age.

Case 2, female, colored, aged 72. While sweeping the porch fell. Upon examination found fracture of the neck of right femur. The patient belonged to the indigent poor class, environment very bad from a sanitary standpoint. My consultant in this case recommended that the patient be transported to the County House to become a county charge, as she would remain a hopeless cripple the remainder of her life. The patient seriously objected to being removed from her home and begged to be allowed to share the sympathy and affectionate devotion of her husband who had administered to her wants for more than half a century. It was decided after this strong appeal to give the patient the best treatment possible under the circumstances. A plaster-of-paris dressing, including limb and pelvis, was employed with sand bags on either side of the limb, together with moderate extension weight. In the course of the third week and for want of proper attention on the part of the nurse, a quantity of urine was emptied in the bed and the patient allowed to remain in that condition for several hours. The result was a bed sore developed which caused much trouble thereafter, making it impossible to maintain the fragments in apposition. However, at the end of six weeks the patient was put in a chair and later on used crutches. It has been 7 months since the accident, and this patient is able to get about, sweeps, washes dishes and performs the ordinary duties of housekeeping. In this case we got fibrous union, and while not entirely satisfactory, is much better than total loss of function of limb.

Case 3, female, aged 76. Fell on steps and fractured neck of right femur. This accident happened in the city of St. Joseph, 35 miles from the patient's home. A surgeon of large experience was called, but refused to treat the

case unless taken to the hospital, as he said it would be impossible to get union if treated at house where accident occurred. The patient and friends were not willing to comply with this request, and the doctor retired from the case. I was called by telephone immediately after the accident, having been the family physician for many years, and when I arrived found a resident physician had been called also. We proceeded to reduce the fracture and apply the plaster-of-paris dressing in this case with medium extension weight. The sand bags were called into requisition to aid in immobilization. No change was made in splints during the entire time patient occupied the bed, notwithstanding a troublesome bed sore which developed during the third week, which was also the result of wet sheet and bad management or neglect in sponging the hips with dilute alcohol as directed. At the end of eight weeks the patient was placed upon a stretcher and taken home on train, a distance of 35 miles, thence 5 miles to her country residence. After a few days rest in bed, crutches were employed and more or less weight put upon the foot of the injured leg. Improvement continued right along. It is now seven and one-half months and the patient called me up a few days ago to say that she had dispensed with artificial support and was getting on very well. The result in this case is bony union undoubtedly, as the limb seems firm at the seat of fracture, and but a slight degree of shortening.

The three cases seem to be of more than ordinary interest, inasmuch as age and environment threatened the overthrow of any effort at restoration of the function of limb. Let us hope that these unfortunate patients will receive the very best efforts of the surgeon at all time. In "John" we read of "the Pool Bethesda at Jerusalem with its five porches in which lay a great multitude of impotent folk—the blind, halt, withered, waiting for the moving of the water." The surgical porches are full of impotent folk today, waiting for surgical skill, which we hope will yet reach that high plane of perfection, which will enable the surgeon to so skilfully coaptate the fragments of bone as to eliminate any degree of shortening deformity or limitation of motion. Then it will be said of the good surgeon as it was said of the lowly Nazarene, "the lame came to him and he healed them."

DISCUSSION.

Dr. John D. Seba, Bland, Mo.: This subject of fractures in old people is one which requires considerable enthusiasm upon the part of the surgeon to treat them successfully. The ordinary busy surgeon, the one who is only after the dollars, and wanting to do all the work that he possibly can, as a rule would make a failure, unless the patient is in a hospital where the attendants may be directed.

Unfortunately, or fortunately, I have not had very many of these cases to contend with. Those which I did have I found tried my ingenuity and inventive skill to put in position to make them comfortable and to get the parts together so as to permit them to unite. I was very well pleased yesterday to see this combination of elevation of bed trolley and splints and other paraphernalia. I think I shall invent that when I get home. (Laughter.) I was at Chicago recently and since then I have invented a few operations, too. Enthusiasm and a desire to do one's whole duty towards these unfortunate old patients who have fractures of the femur are required to bring success.

I knew of a case of an old soldier, 75 years of age, who fell on his hip. He had something, —probably Dr. Grant and Dr. Ruth could have said just exactly what it was; I didn't know, but I knew it was some kind of a fracture. I put it up and kept it up, and in the course of about six weeks he was able to walk, but he is still in the land of the living, and hence I could not present the specimen here as these other doctors have done. (Great laughter and applause.)

Dr. H. M. Dean, Muscatine, Iowa: I would like to ask the doctor a question. I would like to ask him whether when he put that fracture up with extension he put it parallel with the body or whether he put the weight high enough up so as to raise the foot from the bed or whatever the limb was placed upon.

I had a patient with a fracture of the neck of the femur. He was a photographer and he had what you might call "a house," it was so large, on wheels. He was driving about the

country and there came up a storm of wind and rain and blew pretty hard, so he got on the opposite side of the structure from the wind so as not to get wet. The building was blown over on him and broke the neck of his femur. We gave him an anesthetic; we found that there was plenty of motion there, and crepitus, and were sure the bone was broken. He would not allow any splints or pulleys or anything about the limb. I put it up at about an angle of 20 degrees with his body. I had a pillow bent so that it would give a little pressure at the knee and kept his limb on that, and that man has a good, useful limb; and I think the reason why he has gotten along so well is on account of its having been treated flexed. Dr. Ruth showed us that the muscles tend to pull the tendon, muscles and tissues into the fracture if it is out straight, but if it is elevated there is a tendency to pull them out, and that is why I ask the question.

Dr. E. S. McDonald (closing): In regard to the extension weight, in the treatment of fractures of the neck of the femur, I always flex the limb enough to slip a small pillow under the knee, and then apply the weight. I wish to add this much to what I said before. It is not necessary to keep these heavy extension weights on any considerable length of time. The muscles become fatigued very soon, and the fracture does better when the extension weight is reduced. Consequently I cut the weight down one-half in about two and a halt weeks. So far I have had very good results, but I have been very watchful with my patients, giving them the benefit of the very best treatment possible to restore the function of the limb.

Strangulation of the vermiform appendix produces symptoms which are rarely those of a typical strangulated hernia. The action of the bowels may be unaffected or there may be even diarrhea. Vomiting is seldom marked, does not persist, and seldom, if ever, becomes stercoraceous. It is probable, however, that many of the cases in which strangulation of the vermiform appendix is said to be present, are in reality instances of appendicitis in a hernial sac.—*Eccles.*

A CASE OF MASTOID ABSCESS, WITH OPERATION AND RESULTS.*

L. E. WILLIS, M. D., NEWPORT, ARK.

Mrs. D., aged 60, received a severe blow over right mastoid region February 5, 1906. On February 13 she had a severe chill, followed by an excruciating headache and temperature of 102. She continued to have fever and some pain for next 40 days, not being able to sit up, or rest without artificial means. About the last of March her right ear began discharging, which seemed to give her some relief from pain, but she continued to have rigors and slight convulsions of left arm and leg, and complained of a numbness of left side of body. She was under the care of a physician from February 13 until the time I was called. The physician had made a diagnosis of la grippe and had treated her for the same, so I was informed.

I was called April 4, and an examination revealed temperature of 102; pulse 127, thready and intermittent; cheeks flushed, eyes dull, tongue heavily coated, and breath very offensive. She complained of a severe throbbing pain over right mastoid region, of nausea, vomiting, numbness of entire left side of body, and at times she was delirious. She was very weak and anemic. She had a slight purulent discharge from right ear and considerable swelling and discoloration over right mastoid region. Upon examining the external auditory canal I could see quite a good sized opening in the tympanum.

Diagnosis.—Mastoid abscess, with probable cerebral abscess. This diagnosis was made after studying as to whether the trouble was caused from trauma or as the result of la grippe, causing an otitis media followed by suppuration,—at any rate I was confident of one thing, and that was that I had pressure and sepsis to deal with.

Treatment.—After cleansing the auditory canal with a warm solution of boric acid, I applied heat by means of hot water bag and gave her remedies to relieve the pain. The

*Read at fifth annual meeting Rock Island System Surgical Association, Denver, December 4, 5, 1907.

next day I saw no improvement and decided to go into the mastoid. I was afraid to use a general anesthetic on account of her heart's action and on account of 5 per cent of albumin in the urine, which I detected upon examination, so I decided to use a 1 per cent solution of cocain as a local anesthetic, instead.

After shaving the scalp in the usual manner and cleansing the external auditory canal with 1:8 solution of hydrogen peroxid in hot sterile water and then packing external auditory canal with iodoform gauze, I then went over field of operation with bichlorid solution (1:3000) and placed pad wet with this solution over surface till hands, instruments and dressings were prepared. I injected my cocain solution along line of incision, which was in this case the usual one used in mastoid operations. After waiting a few minutes, I made an incision from tip of mastoid to upper attachment of ear and down to the bone. Upon removing the periosteum found the mastoid process dark colored about 1 inch above the tip. Then with mallet and chisel I soon removed the outer plate of bone and entered the cells, encountering some pus, granulation tissue and necrotic bone. After curetting out all necrosed bone in sight, I mopped out and packed with iodoform gauze and dressed with iodoform gauze and sterile cotton held in place by a bandage.

The patient stood the operation remarkably well and she improved for the next 13 days. During this time there was some discharge, but not very profuse. On April 18 all discharge stopped. She had a severe chill that afternoon, followed by high fever and convulsions. During the next 15 hours she had 24 convulsions, followed by complete paralysis of left arm and leg, right side of face; also paralysis of the bowels and bladder. I opened up the wound under local anesthesia, cleaned out the opening in mastoid and found some pus escaping from a small opening in inner table near the lateral sinus. I cut away a small portion of the inner table, when there was a gush of pus, 2 or 3 oz. of foul-smelling pus escaping. I then mopped out the cavity and packed lightly with iodoform gauze.

There was some discharge for the next six days. Within 48 hours after the evacuation of this abscess the paralysis passed away and the patient rested well. She made a complete recovery within the next five weeks and is now in the best of health.

DISCUSSION.

Dr. A. H. Andrews, Chicago: The important thing in this particular case would be to determine whether the mastoid abscess was due to an injury or whether it came from some other cause, since I suppose it was a railroad case—

Dr. L. E. Willis: No, it was not.

Dr. A. H. Andrews: Then it is not so important. It is impossible to know what is the starting point of all of these mastoid abscesses. We have them secondary to infection of the middle ear; we have those which are independent to any infection in the middle ear, so far as we are able to ascertain. Some of the most obscure things in all the whole domain of medicine are inside of the mastoid process. It is not always easy to know what we have; indeed, it is rarely possible to know exactly what is going on within the mastoid when we have reason to believe it is diseased.

There is one method of examination in these cases which I did not hear mentioned and that is the transillumination method. No mastoid which is full of pus will allow light to pass through it as freely as will the normal mastoid. The transilluminator placed behind the ear in the dark room, with the speculum in the ear will show whether the mastoid is full of pus or whether the mastoid cells are open. I think this is not used as universally as it ought to be. It is a valuable addition to other methods of diagnosis in these suspicious cases, and the more obscure the case the more important it is to use this additional method.

I would not criticise the doctor, although it does seem to me that he waited a number of days when the indications were clear for doing something, and doing it immediately.

With regard to extra-dural abscesses, which the doctor describes, they can frequently be found if sufficient care is used in the first operation. Sometimes we believe they come on secondary to the primary condition, and must

be drained later, but it is of exceeding importance to follow up all the sinuses which may be discovered in the primary operation. In a number of cases I have explored innocent looking areas and have found that they led to extradural abscesses in the neighborhood of the lateral sinus.

Dr. J. E. Minney, Topeka, Kan.: The doctor is to be congratulated on his success. He looks to me to be a man you could trust. I am not getting any money for that. (Laughter.)

The symptoms, though, that he describes are too pronounced, entirely too pronounced for a simple mastoid trouble. There is a plan we have followed successfully in finding out whether these mastoids all had to be opened, for I used to jump on to all of them, open them all. I thought I was doing something big; I did my best, of course, and that, you know, is all that anybody could do. But we have had several severe cases in which we have used irrigation and we prefer it, doctor, to your method. That was very good at the time you pursued it, but when you find an irrigation makes the patient comfortable for one or two hours, irrigate.

One case in which we used the ordinary fountain syringe with a quart of water would make the patient *dizzy*. The canal was swollen so we could not see the drumhead, the whole side of the head swollen, a typical acute mastoiditis, and other aurists she had called on told her that an operation was absolutely necessary and we thought so too, but she would not permit it. We began to irrigate it, beginning with a quart to a half a gallon and then from a half a gallon to a gallon of water. The ear was irrigated with it, as hot as it could be endured comfortably, the time of relief gradually increased from 1 to 2 hours, and they kept that up night and day and the patient got well. But when there is a discharge from the ear and the pain keeps up and your temperature keeps up, but particularly if your pain continues, you have something there to deal with more than the tympanic cavity, but irrigate, irrigate.

Now, I want to say something to the general surgeons, and they can down me on this if they see proper; I believe this: let other antiseptics alone; use soap and water, *soap and water,* the kind our old mothers used to make, that is, have it is good as that—soap and water, and plenty of it, and don't brush your hands as much as you are doing and skin your arms and fingers up, and have them rough. I believe very frequently in cleansing those wounds that irritating substances and poisons are driven into the wounds which would not be driven in if ordinary care was taken and we were not under the impression that we had to do something heroic.

Dr. Willis (closing): If you paid close attention to my paper, you will notice in regard to what Dr. Andrews said that I waited a little too long (that was the criticism he made) to operate on this case; this case came under my care about 9 o'clock at night and I operated the next morning about 11 o'clock. So I do not think his criticism will stand.

The X-Rays in Theory and Practice.

THE X-RAY IN PERSONAL INJURIES.

GORDON G. BURDICK, M. D., CHICAGO.
Professor of Radio-Therapy and Photo-Chemistry, Illinois School of Electro-Therapeutics.

Few railway surgeons realize the wonderful help furnished by the x-ray in accidental injuries. It is probable that many thousands of dollars are paid out annually by the transportation companies which would be saved by a more frequent use of the x-rays in all bone injuries. In looking over the display of skiagraphs and case-histories recently in one of our large metropolitan laboratories I was astonished at the number of plates showing errors in diagnosis.

In one case where a man was thrown from a train when it suddenly started up from a station, a fracture of the surgical neck of the femur resulted. He received the usual treatment for this condition, but did not seem to

improve rapidly, and eventually the case found its way into court. I was selected to make a diagnosis of the injury, several skiagraphs were made which showed two things not found

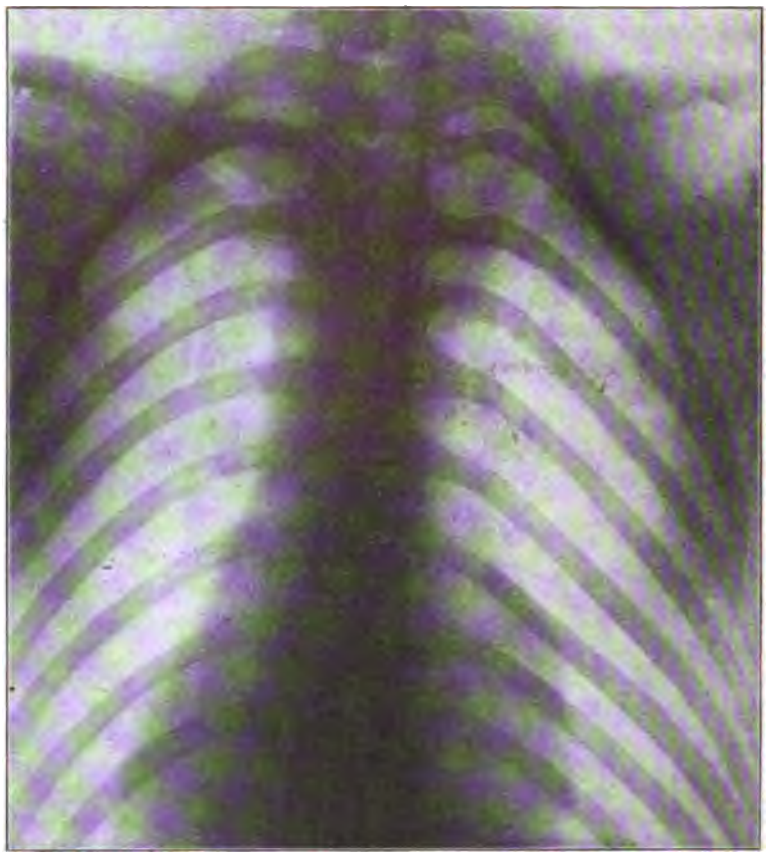

Fig 1. This radiograph was made by the Author with the Victor Portable Coil. Time of exposure, 2 minutes. Healthy subject, no injury; picture simply made for demonstration.

Fig. 2. Another healthy subject, picture made for demonstration. Same coil; exposure time, 2 seconds.

in the original diagnosis: a dislocation of the hip joint and the fact that the bone was de-

Figs. 3 and 4. Two views of the same fracture, taken 4 months after injury. Same coil, exposure time, approximately 5 seconds.

stroyed by an osteo-sarcoma. The diagnosis saved the railway company about $10,000, and materially modified the patient's views regarding the financial outlook, by his acceptance of $300 in full settlement of a very awkward situation.

This has happened so frequently with various modifications that it has seemed a wonder to me the patients do not get after the negligent physicians instead of after the companies. I believe—judging from the number of cases which have passed before me in the last year—that the non-use of the x-rays costs the railway companies of this country about $100,000 every year. Certainly hundreds of cases show up in the laboratories with a history of fracture or serious bone injuries which the x-rays fail to corroborate. I am under the pledge of secrecy in over 300 cases at the present time not to reveal the fact that certain parties have had work done in my laboratory.

The railroads are paying large verdicts to this class of customers every day, and are at the mercy of as unscrupulous a clique of legal and medical gentlemen, whose morals are slightly out of plumb as can be found anywhere today. There have been many reasons why railway surgeons have been reluctant to take up the x-ray. For example, I presume the great majority of them are underpaid and so are loath to invest several hundred dollars in an apparatus, and spend several months' time trying to use it satisfactorily. Again the great majority of local surgeons do not have half a dozen cases of serious injuries to treat in the course of a year.

Metropolitan x-ray laboratories have been reluctant to bid for railroad work owing to the small fees the companies are willing to pay. In order to maintain their reputation sufficient margin of profit must be left, in order to allow the skiagrapher to make more exposures if required to clear up doubtful points, rather than to allow a surgeon to be misled. They are compelled to mortgage their liberty in many cases to appear in court, and their liberty is ser-

Fig. 5. Showing total non-union 7 months after fracture. Same coil.

iously curtailed waiting upon our slow-moving courts.

A very interesting case shown was an injury to a workman by a narrow-bladed chisel breaking and striking the victim in the eye. A local surgeon made an iridectomy, and failing to discover anything referred the patient to headquarters, so he finally found his way to my laboratory for examination. There was a piece of wood chisel ¼-inch long by $\frac{3}{16}$-inch wide and ⅛ inch thick, tapering to a cutting

edge, and strange as it may seem behind and in contact with the iris. How the surgeon failed to turn the cutting edge of his knife will remain a mystery.

I am incorporating these cases with much more information regarding personal injury cases in a work which is now on the press.

Within the last year means have been found whereby the railway surgeon can—to a certain extent—take advantage of this help to diagnosis. This is due to the efforts of Mr. J. B. Want, the electrical engineer of the Victor Electric Company, who has succeeded in devising a portable coil which will work upon either the alternating or direct current. It can also be used from the batteries of an electromobile on a pinch.

This apparatus while small and portable is not to be confounded with the numerous toys offered the profession at various times. It has withstood tests for several months, and has been proved to be capable of making any ordinary skiagraph of the body in a reasonable time.

It is built upon the high-frequency lines. The commercial current is taken in, and transformed to a high potential current (30,000 volts). This charges the condensers, and they in turn the inductors. A very hot 5-inch spark is available for work, which produces enough x-rays to make a fine skiagraph in a very few minutes' time.

I have made numerous skiagraphs with this new apparatus, and am satisfied that all parts of the body can be successfully taken. Numerous prints made with this apparatus compare very favorably with those I have made with far more expensive machines.

72 Madison street.

AVULSION OF ANKLE-JOINT.

EDMUND PENDLETON TOMPKINS, M. D., ROANOKE, VA.

On a hot July day some years ago I was hastily summoned to an old lady who had, the messenger said, broken her ankle. On arrival I found the patient, a woman of 63, had sustained not simply a fracture but what might be termed an incomplete avulsion of the ankle. While climing down a ladder from a haymow, the foot of the ladder slipped out, precipitating her to the ground, a distance of some 10 feet or more. She struck on her feet, or more probably on one foot, on a sloping surface of ground, and her foot was turned as it would in an ordinary sprained ankle, only more so, the momentum of her body being so great that the foot was turned completely over. The internal malleolus was snapped off, all the ligaments in the ankle torn apart, the ends of the tibia and fibula thrust through the skin, and the sole of the foot turned directly upward, facing the body; the flesh shoved up on the bone, much in the same way a glove finger with a hole in the end of it might be shoved up on the finger. There had been some hemorrhage, but no considerable arteries had been ruptured. The wound was covered with chaff and litter, and the patient suffered severe pain.

I administered at once a hypodermic of morphin and atropin, and while waiting for it to take effect held a conference with the family. I told them two courses were open, to amputate at once, in which event the patient, if all went well, would be out of bed shortly; or secondly, and what I preferred to do, make an effort to save the foot, though with inevitably a stiff (ankylosed) joint, even if I succeeded, and a much longer time in bed in any event. I explained to them the risk of gangrene, etc., and that I might have to amputate later anyway. They were decided in their objection to immediate amputation, and I coincided with their view.

Returning to the patient, with only such assistance as the family could give, I put her under chloroform and trimmed off the ragged bits of flesh, and removed the tip of the malleolus which was broken off. Then I adjusted the foot in its natural position, made a sort of fracture box, consisting of bottom, back and one side, leaving the other side off so as to get access to the wound. This was partly filled with cotton batting and the foot and leg held in it with adhesive straps. The wound was dressed with iodoform gauze at first; later with boric acid in powder and plain gauze. I made the mistake of having the sole portion of the

box not quite at right angle with the leg, which allowed the toe to droop and hence interfered somewhat with walking.

The wound became slightly infected and discharged a thin fluid for some weeks, but by diligent use of antiseptics—chiefly peroxid—it finally ceased. Then a tough grayish diphtheritic membrane formed over the wound, but this after awhile dried up and the wound healed. Some trouble was also caused by an ulcer on the heel from pressure, in spite of abundant padding. I finally cut a hole in the fracture box at this point and pasted a firm cloth over it for the heel to rest on, with cotton interposed.

The long continued confinement to bed was very tedious to the patient, naturally active in habit, and gave rise to numerous small complications. I was several times at the point of advising amputation, and did take an amputating case to the house with me one day but never could quite get my own consent to take the foot off. I have sometimes since thought it would have been better had I done so. But nevertheless the old lady gets about now in comparative comfort by aid of crutches. There is no particle of motion in the joint and it is somewhat enlarged, but as the old lady said when I suggested amputation: "No, I don't want my foot taken off; when the Lord takes me I want to go *all together;*" her wish will probably be granted.—*Virginia Medical Semi-Monthly.*

THE "MORAL HAZARD" IN ACCIDENT INSURANCE.

In an address read before the Insurance Institute, of Toronto, last March, Dr. J. E. Elliott states that a few physicians "have wilfully and intentionally prostituted their profession in the interest of their patients." Prostitution is a very strong word, and the only evidence to substantiate it in this connection is that a doctor, who had seen a patient (an insured man) for cholera morbus, an illness not included in the list of diseases mentioned in the policy, obligingly placed the claim under one of the diseases which was mentioned in the policy.

Dr. Elliott does not allude to the "moral hazard" of the doctor of the Accident Insurance Company. As the manager of one of these companies put it to us lately, the medical officer of the company is in a position of defence, ready to treat as a rogue every claimant not proven to be honest. Sometimes, perhaps, with the best of intentions, he reports against a just claim. We know of an instance in which the medical officer of a Toronto Accident Company, passing over the reports of two practitioners, without making any clinical examination of the patient himself, refused to accept a diagnosis of traumatic neuritis of the anterior crural nerve. This medical officer reported the case as one of muscular rheumatism and the accident claim was rejected by the company.

Dr. Elliott suggests that, as a means of having control over the ailments and accidents of the insured, "One medical man should be appointed in each of the larger agencies that would warrant it, who would be independent of any one company, but rather the representative of the whole, and who would keep in touch with the claimant from the beginning of his disability to the end."

If the competing companies would only agree to choose such a referee, it would certainly be a good thing for the lucky doctor who would get the plum. If he were a thoroughly competent man, one of wide culture, not biased, diplomatic, shrewd to detect malingering, but able to tell the difference between simple neuritis and myalgia, he would help to strengthen the cause of accident insurance among a doubting people.

As accident insurance is now very much in demand, physicians, whether as the attendants of claimants or the medical officers of companies, should be scrupulously exact in the diagnosis of the injuries or diseases of claimants.—*Canadian Journal of Medicine and Surgery.*

Acetic acid brushed in a line over a plaster-paris bandage will render it soft, and in a few minutes it may be cut with an ordinary knife. —*Red Cross Notes.*

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ANNUAL MEETING.

The Fifth annual meeting of the American Association of Railway Surgeons will be held in Chicago, October 14, 15 and 16, 1908.

THE MARKET PRICE OF CUTICLE.

A Chicago hospital advertises for a "healthy white to supply skin for grafting on a burn; $20 and expenses."

FIRST AID IN ACCIDENTS.

Under this caption the following note appears in a popular magazine, which shows the queer notions as to technic and pathology entertained by the laity:

"A country boy knows that the fine dust of the brown fungi he calls puffballs will stop bleeding. When he cuts himself he hunts for one of these if the cut is not serious. If the cut is deep it is wise to bathe it in warm water with carbolic in it or a tablet of bichloride of mercury dissolved in the water. Carefully remove all foreign matter in the washing, and then, pinching the lips of the cut together, put on strips of adhesive plaster. Be sure and leave little spaces for pus to run out. This running of pus is a natural process and is not alarming unless persistent and the pus comes in unreasonable quantities. Sometimes the blood flows so rapidly that you cannot close the wound with plaster. If so, tie a bandage tightly above the wound before you attend to the wound itself. This will stop the flow of blood, and, nature having formed her clot, you can do your part with plaster."

ANTI-PASS RULING.

The most recent ruling of the Inter-State Commerce Commission in relation to the issuance of passes is as follows:

Many abuses in the issuance and uses of passes have been discovered by the commission which it is desired to correct, and to this end, and because of the misinterpretation of the law by carriers generally, the commission at this time makes announcement that it will recommend the indictment and prosecution of all carriers and persons issuing passes to, or allowing the use of passes by, any persons not included within the designated classes to whom free transportation may be given by carriers subject to the act to regulate commerce, as set forth in said Act. Among those not included under the provisions referred to are the following:

1. Officers or employes of news companies other than newsboys.

2. Officers or employes of telegraph or telephone companies, excepting when personally engaged in operation, extension, repair or inspection of lines upon or along the railroad right-of-way and used in connection with the operation of the railroad.

3. Officers or employes of surety, transfer and baggage companies, except baggage agents.

4. Officers or employes of carriers not subject to the act to regulate commerce, including officers and agents of steamship and stage lines not subject thereto.

5. Officers or employes of subsidiary corporations, which corporations engage in any employment for, or render any service to, others than the carrier—save that such officers or employes may be granted free transportation when engaged on the business of the carrier.

6. Families of local attorneys, surgeons and others who are not regularly employed by carriers.

It is also proper to add that the commission will regard it as a breach of the law to issue annual passes to those to whom such passes may properly be given unless the name of the person or persons to whom given is specifically written or printed thereon. "John Smith, car and party," is not a sufficient designation of the proper user—the members of the "party" must also be named and be persons entitled to free transportation under the law. Where transportation is issued to an officer or employe of a railroad "and family" the names of the members of the family must be designated.

Carriers are enjoined against the destruction of records or memoranda touching the issuance of passes, and the passes themselves, coming into the hands of the carriers after use, must, until further order of the commission, be retained for a period of not less than five years.

It is no doubt true that a considerable number of local railway surgeons feel that they have been unjustly treated by the railway company on account of the fact that very little inter-state transportation has been issued. It will be readily seen by careful reading of the commissions' ruling that the railroads are helpless in this matter. If it were possible, railroad companies would be very glad to issue transportation as in the old days, which would be some compensation for the care and attention they are called upon to render to persons whom nobody feels responsible for, or is willing to pay for. D. S. F.

Translations

THE TREATMENT OF WOUNDS OF THE EYE.

A. TERSON, M. D., PARIS, FRANCE.

(Translated for THE RAILWAY SURGICAL JOURNAL.)

The treatment of wounds of the eye, destined to limit the impairment of vision, to avoid general infection of the eye, and above all sympathetic ophthalmia and blindness, differs materially whether the wound is scleral or corneal, penetrating or non-penetrating, whether it is a rupture or a penetrating wound with or without foreign body, uveal hernia, lesions of the refractive media, lesions of the adnexa.

Emergency topical treatment varies with the condition of the wound, infected or not. Non-penetrating and non-infected wounds will be treated by careful asepsis, avoiding irritating antiseptics, but resorting to the use of aseptic collyria, aseptic dressings, generally dry and not often renewed; i. e., the treatment after operations on the eye. A penetrating corneal wound, in addition calls for the use of a myotic, in the beginning the reduction or excision of prolapse of the iris.

A dressing is indispensable and sometimes must cover both eyes; if there is no infection it should be dry. The author has tried asbestos, but it is not absorbent enough and inferior to gauze. Wounds coexisting with infected adnexa (dacryocystitis, ozena, etc.) demand from the beginning an antiseptic treatment (moist dressings, collyria of silver and mercurial salts) at the same time that the lacrymal sac, the nasal fossæ, etc., undergo energetic and even operative disinfection.

An infected wound necessitates the most absolute antisepsis. Silver collyria (collargol, argyrol) frequently have a useful action or, preferably, mercurial collyria (bichlorid or salicylarsenate of mercury "enesol") which are equally efficacious and less painful. Dionin either in powder or injection is an adjuvant. Adrenalin must be scrupulously avoided.

Among useful general measures (serotherapy,

mercury, collargol, etc.) it seems that antidiphtheritic has the same effect as antipneumococcic serum and that its employment reinforces the local treatment. If the mercurial and silver collyria, and serotherapy are not sufficient, subconjunctival injections are indicated (especially mercurial, sometimes salt solution or dionin).

If the infection spreads—in addition to other means—cauterization with the actual cautery, penetrating in advanced cases, nonpenetrating in the others, is the most powerful resource. Sæmisch's incisions, paracentesis, are sometimes indicated. Iridectomy is to be done when necessary at the beginning of the period of repair.

Wounds of the sclera are treated in the same manner as the preceding, and if they are not infected will be protected by the following means:

2. Surgical protection of wounds of the eye comprises 3 principal forms—direct suture, conjunctival suture, with or without autoplasty, tarsorrhaphy.

Suture of the cornea is to be performed only for extensive irregular wounds, with overriding and a tendency to curling of the flaps. Extensive wounds of the sclera necessitate immediate suture of the conjunctiva, epi- and intrascleral, not extending beyond the sclera. An autoplasty with a bridge of conjunctiva will be useful in wounds which are not too extensive. A small purse-string suture suffices for minor wounds of the sclera. These maneuvers are to be carried out with an assured technic, so as not to risk aggravating the condition. The author uses either very fine silk for suture or reindeer tendon which is absorbed less rapidly than catgut.

No matter how good the immediate results of ocular sutures are, they should only be made before inflammation has set in. Enucleation is still called for in cases where sight has been lost and sympathetic ophthalmia is feared. In many wounds of the sclera, the detachment of the retina will, sooner or later, markedly diminish the benefits ensuing, not to mention other equally disagreeable complications.

3. When there is a hernia of the uveal membranes and especially of the iris, reduction (if possible) excision (if this cannot be done) should be resorted to only in the beginning. Later on excision or the actual cautery may bring on sympathetic ophthalmia; abstention, myotics, compression (bandage, tarsorrhaphy) and conjunctival flaps are preferable. Enormous prolapses may be nearly entirely destroyed by chemic cauterization (nitrate of silver).

4. In wounds with lesions of the lens, the dislocated lens need be extracted at once only when it prevents coaptation of the wound or gives rise to hypertonic accidents. As a rule when the lens is dislocated under the conjunctiva it can be removed when the wound has cicatrized. Immediate operation for traumatic cataract is indicated only when acute symptoms are rapidly produced.

5. Wounds complicated by foreign bodies naturally call for speedy extraction of the latter, with a technic varying according to the site and the nature of the body, whether magnetic or otherwise. Enucleation is preferable when the object cannot be extracted. After aseptic measures and protection of the wound, the x-ray is an admirable resource for showing the presence of a foreign body, its position, and if it has traversed the eyeball completely what may be done for preservation of the globe.

6. The treatment of ruptures is similar to that of penetrating wounds, but infection is much less common. Conjunctival occlusion, or in some instances tarsorrhaphy, will be done whenever it seems advantageous. Sclero-corneal ruptures sometimes give good results. The end-results in extensive ruptures at the middle of the sclera are often very mediocre.

7. In complicated wounds (large lacerations, obstetric lesions, etc.) we must try as far as possible to prevent the eye from being injured during the treatment of the tissues in the neighborhood. Under these circumstances tarsorrhaphy, preventive or curative, will be found useful, as well as in the course of prolonged operations on the orbit or face. Enucleation is occasionally necessary for orbito-cranial disinfection after major traumata.

8. As regards enucleation for sympathetic ophthalmia, at the present time there is too

great a tendency to conservatism, just as some time ago there was too great a tendency in the other direction—operation. Enucleation is hardly ever called for as an emergency operation, but it would be returning to the practice of the forefathers to always leave these dangerous, painful and deformed eyes. Their retention will be strongly over-balanced by cases of sympathetic blindness, even though there be but one.

It is wrong to say there is always time for enucleation. We should, therefore, proceed at once to enucleate those damaged eyes where vision is lost. In children we should be reserved and replace enucleation by exenteration, always remembering that sympathetic ophthalmia in young children is especially grave. In accidents to workingmen enucleation of irrevocably damaged and dangerous eyes should be done early.

9. Concerning panophthalmitis we should aid the palliative treatment (hot applications, sedatives, etc.) by surgical measures. Ablation of the cornea by deep actual cauterization gives more relief than simple partial curettement. Ablation of the cornea with total exenteration by the actual cautery or total curettement under general anesthesia are preferable to enucleation; the latter measure has caused a considerable number of deaths in sympathetic ophthalmia, hence Von Graefe was right in condemning it.

In presence of sympathetic ophthalmia the only measure to be recommended is enucleation with extensive resection of the optic nerve, combined with intensive treatment by mercury and salicylates. This plan may prove successful even when the ophthalmia is fully developed. Hence, all partial operations are to be rejected; the enucleation, however, must be done in time if it is to prove beneficial. Mercurial injections—subconjunctival, intraocular, within Tenon's capsule, intraorbital—meet the different indications or when associated with constitutional mercurial treatment, act as adjuvants to the enucleation. Serotherapy (Zur Nedden) has already given such successes that much may be hoped for from this method in the future.

10. In all probability sympathetic ophthalmia is less frequent now than formerly. Further statistics are needed in order to show whether milder cases are the rule instead of being the exception, for grave cases are still to be met with. The data to be established in order to serve as a basis for further researches are of three kinds:

(a) Which injuries to the eyes predispose the most to the development of sympathetic ophthalmia? It would seem that iridocyclitis of the sympathizing eye was necessary, following wounds which have remained unhealed for a long time, wounded uveal herniæ, or intraocular foreign bodies. On the other hand, sympathetic ophthalmia is possible even where there is no solution of the conjunctiva (subconjunctival rupture). Those eyes which have gone through the stage of panophthalmic suppuration or of absolute glaucoma are but slightly predisposed to this ophthalmia.

(b) The minimum period of incubation is 3 weeks, the maximum period, though, cannot be fixed. Researches on the state of the blood should be carried out in subjects with sympathetic ophthalmia, to be followed, possibly by appropriate serotherapy. Lumbar puncture will also furnish some evidence.

(c) From a practical standpoint it is of the utmost importance to be aware of the time limit for preventive enucleation. Dianoux after making a series of observations places it at 7 weeks. In the present state of our knowledge lesions of the fellow eye coming on more than 7 weeks after enucleation of the wounded one cannot be attributed to the primary lesion.

Finally, despite assertions to the effect that enucleation predisposes to sympathetic ophthalmia (which are disproved by close examination of the evidence), enucleation of an eye threatening the opposite one with ophthalmia is entitled to the confidence of the profession; always provided it be done in time.

DISCUSSION.

M. Trousseau said whether the wound was infected or not, he never uses the various topical applications which seem to him to have an injurious effect. When prescribed by others he has seen surprising results from merely ceasing their use. In wounds of the eye, su-

tures, at least the conjunctival or episcleral ones, predispose somewhat to sympathetic ophthalmia or to ocular infection. We should be very chary of all other interventions on an injured eye such as resection of a herniated iris. Enucleation alone puts a stop to the sympathetic ophthalmia and prevents development of further lesions in the sympathizing eye.

M. Antonelli uses the galvano-cautery when there is a wound or an erosion of the borders of the eye, no matter how little infiltration there may be of the edges. Amputation of the anterior segment of the eye, with exenteration or not, according to the indications, will in some cases advantageously replace enucleation.

M. Parisotti said in wounds of the ciliary region it is best to cover the breach, as far as possible, with a flap of conjunctiva in order to prevent the development of sympathetic ophthalmia.

M. Fromaget: Extirpation of the lacrymal sac is necessary in all cases where the wound of the eye is complicated by dacryocystitis. Preventive enucleation should be done in all cases when vision is completely lost and the eye is the seat of painful and dangerous inflammations. The treatment of early sympathetic ophthalmia consists in enucleation of the sympathizing eye.

M. De Lapersonne called attention to those cases which are becoming more and more frequent, in which evidences of slight sympathetic ophthalmia may be seen some months after a trauma. Whenever this ophthalmia is feared enucleation is called for with free excision of the optic nerve. In cases of panophthalmitis, exenteration by the actual cautery is much preferable to other methods of intervention.

M. Vacher advised the use of oxygenated water and the galvanocautery in infected wounds of the eye.

M. Lagrange has used iodoform with advantage in all cases. He has seen little benefit from serotherapy. Every year he sees many cases of sympathetic ophthalmia in which he resorts to enucleation as quickly as possible. After enucleation, grafting a rabbit's eye is of great utility in forming a good stump.

M. Nuel observed that many of the accidental traumas of the eye are aseptic and that in numerous cases, mechanical cleansing of the eye and the eyelids, aided by a dry dressing will suffice to prevent consecutive accidents.

M. Abadie believes it is not always necessary to perform enucleation of the sympathizing eye. Energetic and deep cauterization of the wound which is then covered with a flap of conjunctiva, will often suffice to arrest development of the inflammatory accidents. If not, enucleation will be done, and bichlorid injected at the apex of the orbit on the same side as the sympathizing eye.

M. Morax said in two recent cases of ocular trauma he had resorted to ablation of the anterior segment of the eye. In cases of panophthalmitis he invariably prefers enucleation to exenteration by the actual cautery. The latter does not assure asepsis of the ocular stump and produces eschars the infection of which is always to be feared.

M. Dor attaches great importance to the use of ice as a preventive treatment in infections of the eyes.—*Presse Medicale.*

Irreducible hernia is decidedly rare in children. Probably this is due to the fact omentum is but occasionally found in the hernial sac of young subjects and that the bowel protruded has but little tendency to form adhesions. When the contents of an inguinal sac in children are irreducible, there is sometimes found to be present a congenital cecal hernia, for the cecum cannot be returned because of adhesions, the outcome of its originally imperfect peritoneal covering. Irreducibility begins to be more frequent after 25, but is more common between 30 and 40.—*Eccles.*

Tumors arising from bone have been arranged in 3 groups:

1. Cartilaginous tumors.

2. Bony tumors arising from the bone and periosteum and composed of this type of tissue.

3. Medullary tumors arising from the medulla and resembling it in structure.—*Cathcart.*

For thirst in surgical operations it will be well to remember Semmola's glycerin drink, which is often exceedingly grateful. It is 1 oz. glycerin and 30 grains citric acid to 1 pint of water.—*Red Cross Notes.*

Extracts and Abstracts.

DOCTORS AND LAWYERS.

It is no uncommon thing for members of the legal profession, at banquets and other places, to advance the opinion that theirs is the most glorious profession in the world; that the time of the lawyer is spent in avoiding litigation for his clients, in smoothing the rough places, and making neighbors behave towards each other peaceably. And yet if the doctors of the country were to do what the lawyers are doing every day, they would be held up to public execration. The doctors are meeting in their societies; comparing notes; sparing no pains to equip themselves so that they can be of the highest and best service to their patients. The lawyer, while he is informing himself so as to win his cases as against the other fellow, is rarely endeavoring to save trouble and expense to his client. A case came to our notice recently, in which some medical men were involved. The lawyer on the other side got them into court on a frivolous proposition, and admitted before the court that he knew very little about the case; that his complaint contained matter which he found on coming into court was contrary to the facts, and that it looked as though he had no case whatever. If, before going into court, he had made the slightest examination of the merits of the action, he would have saved considerable expense to his client. But it was not a part of his business to save his client expense or trouble. To have told his client at the first that he had no case would not have entitled him to as large a fee as he could secure after appearing in court. He was after his fee; the consideration of his client was a secondary matter. He simply did what hundreds of lawyers are doing every day. A physician, similarly inclined, would give his patient medicine that would purposely and designedly aggravate his illness, so that he might draw larger fees, and have more visits. We know that this is not the way of physicians. Their policy, recognized everywhere, is to take the shortest and best steps towards recovery, and there are very few doctors who are in the habit of making too many calls on their patients. Generally the complaint is that they do not make calls enough.

* * * * * * * *

There is a side to human nature which must be mentioned in discussing the question of the duty of the physician to the patient and the lawyer to his client. The average client might be willing to pay a lawyer a hundred dollars to drag an absolutely hopeless case into court, doomed to failure, whereas he would begrudge the lawyer half that amount to be told at the outset, after investigation, that he had no case, and should stop before he begins. What medical man has not had patients who were desperately ill, who needed advice and simple treatment, who speedily recovered as the direct result of the physician's care and advice, but who begrudged a moderate bill because the treatment had not consisted of a large number of useless prescriptions, followed by copious doses of medicine?—*Medical Sentinel.*

JAPANESE RAILWAY CARS.

The second and third class railroad carriages give the foreigner an opportunity to study the life of the Japanese people, says an exchange. On entering, the first thing one notices is that white lines are drawn across the glass windows, and upon inquiry the information is gained that some of the people who travel in the cars are unused to glass, which perhaps they have never seen before, and that they are apt to put their heads through if there is nothing to indicate that a solid substance bars the way.

In cold weather all Japanese travelers carry rugs, for the cars are heated merely by long steel cylinders filled with hot water and laid on the floor.

The smallest incident of travel is enough to break the ice, and if a person has a wrong ticket, or has lost anything it is a matter of interest and solicitude for everybody else. Many of the passengers are apt to behave with the same unrestrained freedom as in their own homes.

If they are starting on a long journey they at once proceed to make themselves as comfortable as possible. A rug is spread out on the seat, for they are particular never to sit on anything that is not perfectly clean. Then they shake off their wooden clogs, and curl their feet

up underneath. The next thing is a smoke, in which both men and women indulge, sometimes lighting cigarette after cigarette, but more often they use the tiny pipe, which never contains more tobacco than a wisp the size of a pea, and affords one, sometimes two, puffs to the smoker. The ash is then knocked out on the floor, another wisp is stuffed in and lighted from the smoldering ash which has just been thrown away. This is kept up, off and on, for hours.

When not smoking eating is going on. At every station there are venders of the little mandarin oranges. Every passenger buys a dozen or more, and eats them in a short time, throwing the skins about the floor. Boys pass by with tea in tiny earthen pots, a cup placed over the top, and this may be purchased for 3 sen (3½ cents) and the teapot is left in the car. Besides leaning out of the car windows to buy these, the passengers have little wooden boxes filled with lunch. In the upper part is closely packed rice, and in the lower are all sorts of little pickles and bits of cake. Attached are two wooden chopsticks.

The Japanese throw all sorts of refuse about, and from the appearance of a car after the passengers have been in it a little while one would imagine that the people are very untidy in their ways of living. Porters enter at some of the stations and brush up whole pans of refuse, and on some lines of the road a small boy in a spruce uniform comes to the door at each stop with a clothes brush in his hand, makes a deep bow to the occupants and inquires if there is anything that they want.—*International Railway J.*

A *supernumerary thumb or little finger* is a useless appendage, but as it is in communication with the tendon sheath and joint of the digit to which it is attached, special antiseptic precautions must be taken in removing it.—*Walsham.*

Excision of the ankle joint for tuberculous disease is rarely of service. The division of the lateral ligaments and the loss of the malleoli leave the joint so weak. The best method is an extension of posterior arthrectomy (Mikulicz's method).—*Walsham.*

Personal

Dr. J. C. Willis, Shreveport, La., was recently appointed local surgeon for the Vicksburg, Shreveport & Pacific Railway and also the Louisiana Railway and Navigation Company.

Dr. Randell Hunt, house surgeon to Charity Hospital, Shreveport, La., enjoys the distinction of being the junior local surgeon for the Texas & Pacific Railroad, having been appointed by Dr. J. A. Moore, of Marshall, Texas.

Dr. Louis Abramson, Shreveport, La., proprietor of the North Louisiana Sanitarium and division surgeon for the Kansas City Southern and local surgeon for the Cotton Belt and T. & P. Railroads, is enjoying a few days' recreation in the southern part of the state.

Dr. T. P. Lloyd, Shreveport, La., received communications a few days ago from Dr. Samuel Ayers, Kansas City, Mo., advising him of appointment as division surgeon for the Kansas City Southern Railway and one from Dr. C. A. Smith, Texarkana, Ark., appointing him local surgeon for the Cotton Belt Railway.

Among the members of the A. A. R. S., who are to read papers at the sixteenth annual meeting of the Tri-State Medical Society (Illinois, Iowa and Missouri) at Ottumwa, Iowa, September 8, 9, 1908, are the following:

Dr. A. O. Williams, Ottumwa, Iowa—"Emergency Surgery."

Dr. D. C. Brockman, Ottumwa, Iowa—"Tumors of the Breast."

Dr. E. H. King, Muscatine, Iowa—"Wear and Tear."

Obturator herniæ are much more frequent in elderly females than in any other class. Both sides seem equally liable to be affected, and occasional instances of bilateral obturator herniæ have been recorded. It is believed by some to occur more frequently in women who have been stout and then have rather rapidly lost flesh, and in those who have borne children rather than in those who are nulliparous.—*Eccles.*

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THE INTRAVENOUS INJECTION OF MEDICAMENTS AND ITS IMPORTANCE IN GENERAL PRACTICE.

Erwin Francke, Berlin. (*Medizinische Klinik*, Jan. 5, 1908.) In severe infections, sepsis, puerperal processes, collargol should be tried in 4 to 5 per cent solution, 2 grams (30 grains), being injected intravenously every day or second day, according to the nature of the disease and the effect of the remedy. In one case of severe gonorrheal sepsis, with chills persisting for weeks, one such injection effected prompt and permanent defervescence.

THE PERIODICAL NERVOUS HEADACHE.

Among the most common ailments, especially among the young, are the periodical nervous headaches, and three or four times as many females as males are afflicted with them. Dr. A. F. Schellschmidt, of Louisville, Ky., states that "they generally manifest themselves about the time of puberty and are very severe for a few years, but with increasing age the attacks become less frequent, until at the age of 40 they seem to almost disappear and are seldom or never seen after 50. They are associated with vertigo, nausea and vomiting. The pain is in and around the eyes and while the attack lasts there frequently is partial or total blindness. Those who complain of this trouble suffer from prodromal symptoms for several days before the attack shows itself in an active form, which symptoms differ in different patients.

When treatment is demanded it is more for the pain than anything else. Opium will relieve but does more harm than good as it leaves the system in a worse condition to resist a subsequent attack. Antikamnia tablets give great relief and act quickly. An emetic will sometimes abort an attack. The bowels should be kept open and those diuretics which hasten the elimination of the urea should be administered. If the attacks are due to a reflex nervous condition the cause must be sought and treated.

The adult dose of antikamnia tablets best suited for the relief of these headaches is 2 every three or four hours.

THE TREATMENT OF ACUTE AND CHRONIC CYSTITIS.

L. E. BEACH, M. D., BALTIMORE, MD.

This summer I treated the worst case of cystitis and stricture I ever had with Glyco-Thymoline. There was great difficulty in introducing a catheter, intense pain and some hemorrhage. I used Glyco-Thymoline as an irrigant in 25 per cent solution and it gave relief but the stricture was very hard to subdue. Each time the catheter was used there was fresh irritation; I finally treated the case by means of a fountain syringe filled with Glyco-Thymoline diluted. This gave steady but gentle pressure and the exosmotic action of Glyco-Thymoline upon the contracted passage gradually relaxed the parts and without causing pain or inflammation. I found the structure readily yielded to this form of treatment, and after the first day or two had no need of using the catheter. I continued this course some two weeks and then discharged the patient as cured. I never had such rapid and satisfactory results in any similar case, and of course the credit is due to Glyco-Thymoline, though the method of application undoubtedly materially aided.

Also had about the same time a severe case of prostatitis and cystitis following gonorrhea and used similar treatment. When called in, found the patient in great agony, having passed no water for about 30 hours. In a short time rupture of the bladder would have occurred had he not been relieved. There was acute inflammation of the bladder, hypertrophy of the prostate and a great amount of mucus and pus. Filled bladder with a strong solution of Glyco-Thymoline having each ap-

plication retained half an hour. In a few days inflammation subsided, mucus and pus disappeared and no trace of gonococci. The hypertrophy rapidly yielded to treatment and inside of a month the recovery was complete. Glyco-Thymoline was the sole agent in bringing about this result. I find it the best preparation I ever tried for reducing inflammation.

Pathology and Therapy of Gonorrheal Pyelitis. Sellei and Unterberg, Budapest. (*Berliner Klin. Wochenschr.,* Sept. 2, 1907.) Lavage of the renal pelvis is indicated when internal treatment is unavailing. The authors have used collargol in 1 to 2 per cent solutions and noted good effects from this remedy.

Dr. Charles S. Rockhill, Cincinnati, writes in the *Women's Medical Journal* (March, 1908), on the "Medical Treatment of Cholelithiasis": It has been shown that a large portion of salicylic acid, given by mouth, passes into the bile, inhibits putrefactive processes and disinfects that secretion. Salicylic acid also has a powerful cholagog action, producing a thin bile deficient in solids. It therefore seems to be ideal in its action, for it attacks the two most important etiologic factors of gallstones—infection and stagnation. Bauermeister has proposed a combination of salicylic acid, sodium oleate, menthol and phenolphthalein, the probilin pills. Dr. Rockhill has had experience therewith, and details the following case:

Mrs. P., aged 41, married. Had four children and was pregnant at the time I was called, June 21. I found her in great pain, temperature subnormal, with cold perspiration, some icterus, nausea and vomiting. Has had similar attacks.

I gave her a hypodermic injection of morphine, applied Priesnitz compresses, and washed out the stomach with hot Carlsbad water. The symptoms subsided and I discharged the patient with the usual instructions as to taking Carlsbad salts, exercise, etc. About two weeks later I was again called and found the same train of symptoms. In the meantime I had been advised to use probilin and concluded to try it in this case. After properly cleansing the bowels, I started with 3 pills morning and evening, increasing each dose one pill every second day until 14 pills were taken daily for a period of 3 weeks. Then I gradually diminished the number, the treatment lasting 3 months. The patient had one attack, not as severe, shortly after she started the medication. Since then she has been well and free from all symptoms.

Dr. Rockhill has had 3 other cases that yielded in a similar manner, under the same treatment, and one patient who would not follow instructions, was operated upon and succumbed probably to a peritonitis.

Dr. Paul Cohnheim, Berlin, in his "Diseases of the Digestive Tract," mentions in the treatment of cholelithiasis, the use of Probilin, 3 to 4 pills with one-third to one-half liter of very warm water twice daily, adding:

"Only when internal therapy has been exhausted and when severe attacks occur again and again, should the patient be referred to the surgeon."

Collargol injections are usually followed by a chill with temperature up to 105.8° F.; but this phenomenon has no untoward consequences. The use of collargol by intravenous injection is superior to its introduction by enema or inunction, and should be resorted to more often than is now the case.

Puerperal Fever. Dr. Ernst Runge, assistant at the University Gynecologic Clinic of the Charité, Berlin. (*Berliner Klin. Wochenschrift,* March 16, 1908.) In many cases of streptococcus infection, especially in pyemic processes, collargol intravenously, 5 c.c. of a 5 per cent solution daily for two or three days, injected into the cubital vein, occupies the first rank. The manner in which the silver introduced into the body is destructive of the streptococcus, has not yet been entirely cleared up.

Zweig, of Vienna, says in the chapter on *hemorrhoids* of his "Therapie der Magen und Darmkrankheiten": "The anusol suppositories have been found very useful by me; they are a compound of bismuth with iodized resorcin-sulphonic acid, and are introduced daily after the morning defecation and at night before retiring."

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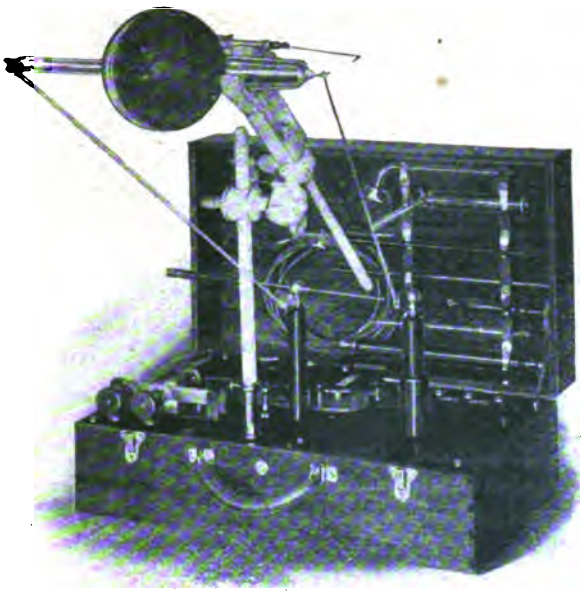

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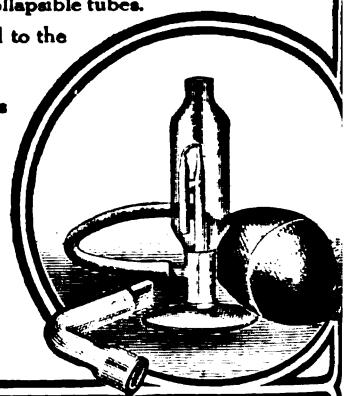

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